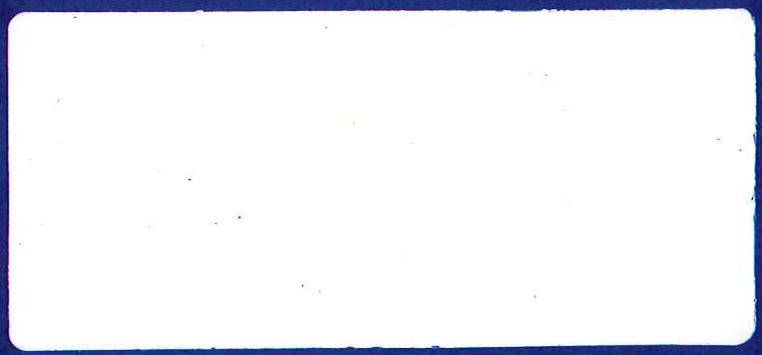


MK-ENVIRONMENTAL SERVICES
A DIVISION OF MK-FERGUSON

ASBESTOS SURVEY AND ASSESSMENT REPORT

DPW PROJECT #89-773
IDAHO STATE TRANSPORTATION DEPARTMENT
DISTRICTS 04, 05 AND 06 DIVISION OF HIGHWAYS
SHOSHONE, POCATELLO AND RIGBY, IDAHO

PREPARED FOR:
STATE OF IDAHO
DIVISION OF PUBLIC WORKS
502 N. 4TH STREET
BOISE, IDAHO 83720

PREPARED BY:
MK-ENVIRONMENTAL SERVICES
P. O. BOX 79
BOISE, IDAHO 83707

JULY 1989

MK-ENVIRONMENTAL SERVICES
A DIVISION OF MK-FERGUSON

MORRISON-KNUDSEN PLAZA
P.O. BOX 79/BOISE, IDAHO U.S.A. 83707
PHONE: (208) 386-5000/TELEX: 368439
FAX: (208) 386-6658/6669

August 09, 1989

Mr. Eugene Pullman
Construction Manager
Department of Administration
Division of Public Works
502 N. Fourth Street
Boise, Idaho 83720

RE: **DPW PROJECT NO. 89-773**
ASBESTOS SURVEYS - IDAHO STATE TRANSPORTATION DEPARTMENT
DISTRICTS 04, 05 AND 06 DIVISION OF HIGHWAYS
SHOSHONE, POCATELLO AND RIGBY, IDAHO

Dear Gene:

Enclosed are five copies of the Asbestos Survey Report for those areas identified in the work authorization for the Idaho State Transportation Department Division 04, 05 and 06 buildings located at Shoshone, Pocatello and Rigby, Idaho. A discussion of abatement response actions and a preliminary abatement cost estimate have been included in the Asbestos Survey Report.

If you should have any questions, please call me at 208/386-5854.

Sincerely,

Tim Bird
Project Manager

Enclosures

cc: File 1999
Reading File

TABLE OF CONTENTS

SECTION I

SYNOPSIS

SYNOPSIS

INTRODUCTION

On May 15, 1989, Tim A. Bird and Harry E. Nichols from Morrison-Knudsen Engineers, Inc. (MK) conducted an asbestos survey of the Idaho State Transportation Department (ITD) District No. 4 Administration Building, Maintenance Shop Building and Sign Shop Storage Building located at Shoshone, Idaho. On May 18 and 19, 1989, Tim A. Bird and Harry E. Nichols from MK conducted an asbestos survey of the ITD District No. 5 Administration Building and Maintenance Shop Building located at Pocatello, Idaho. On May 17, 1989 Tim A. Bird from MK conducted an asbestos survey of the ITD District No. 6 Administration Building and Maintenance Shop Supply Building located at Rigby, Idaho. On June 5, 1989, MK consultants revisited the Rigby site to gather additional materials samples from the Administration Building boiler room. These surveys were conducted as requested by the Idaho Division of Public Works (DPW) representative, Gene Pullman.

Jack Morris of ITD conducted a walk-through tour of the areas identified in the work authorization for the ITD buildings located in Shoshone, Idaho. Bob Harrison of ITD conducted a walk-through tour of the areas identified in the work authorization for the ITD buildings located in Pocatello, Idaho. Jim Hutchens of ITD conducted a walk-through tour of the areas identified in the work authorization for the ITD buildings located in Rigby, Idaho. MK was authorized to survey, sample and assess all building materials and components for the presence of asbestos, to report location, condition, quantity and make recommendations regarding care and handling of known and assumed friable and nonfriable asbestos-containing materials.

In order to gather the greatest quantity of reliable information in the time available, several investigative techniques were utilized. These techniques consisted of brief informal interviews with supervisory and maintenance personnel, visual inspection, assessment, nondestructive sampling, and quantification of all accessible suspected asbestos containing materials (ACM). MK consultants reviewed sketches, provided by the DPW, of the ITD

buildings because no as-built or design drawings were not made available. Information gathered from the sketches, interviews and visual inspection above the ceiling tiles and in the crawlspaces revealed that at least one remodeling project had occurred at each location and that some of the buildings had additions that were accomplished after the original construction of the building.

The survey consultants sampled and submitted for analysis materials suspected of containing asbestos. In addition to quantifying suspect materials, attention was also given to the following factors: material condition, damage, friability, exposed surface area, accessibility, activity and movement in the area, and presence of an air plenum or direct air stream proximity.

All bulk samples were collected in accordance with EPA guidelines and in a discreet and nondestructive manner. A grand total of 51 samples were taken at Shoshone, Pocatello and Rigby, Idaho. A grand total of eight Quality Assurance and Quality Control (QA/QC) samples were included in the grand total number of samples taken. A total of 12 samples were taken at the Shoshone ITD Administration Building, Service Maintenance Shop Building and Sign Shop Storage Building, two of which were Quality Assurance and Quality Control (QA/QC) samples. A total of 17 samples were taken at the ITD Administration Building and Service Maintenance Shop Building located at Pocatello, Idaho, including two QA/QC samples. A total of 22 samples were taken at the ITD Administration Building and Service Maintenance Shop Supply Building located at Rigby, Idaho, including four QA/QC samples.

These samples were taken at various locations, which were representative of homogeneous materials identified throughout each building.

Haztox, Inc., located in Meridian, Idaho, was the laboratory retained by DPW for bulk sample analysis. Analytica, Inc., located in Golden, Colorado, was the laboratory chosen by MK to provide analysis of the split QA/QC samples.

This project was divided into seven phases for quantification and assessment purposes:

Shoshone, Idaho

- Phase I Administration Building (laboratory/loading dock)
- Phase II Service Maintenance Shop Building
- Phase III Sign Shop Storage Building

Pocatello, Idaho

- Phase IV Administration Building
- Phase V Service Maintenance Shop Building

Rigby, Idaho

- Phase VI Administration Building
- Phase VII Service Maintenance Shop Building

The above numeric phase designations will be used throughout the report and in the tables to identify surveyed material locations. In addition to the numeric characters designating locations within the tables, the tables in the report make reference to:

- Suspected or assumed asbestos-containing materials' description
- Quantity of material containing greater than 1% asbestos by volume
- Asbestos type and percentage
- Recommended response action (made by assessing friability, condition, accessibility, potential for disturbance, and air stream proximity)
- Reference photographs and reference floor plans (referenced in the area description tables) denoting location, condition and material type.

Materials which were sampled were selectively chosen to be representative of a given area. However, MK makes no representation, warranty, nor guarantee that the analytical results reported by the laboratory are representative of those conditions existing throughout the area, or that materials other than or in different proportions to those indicated may or may not exist.

TABLE OF ALL SAMPLED MATERIALS AND ASSUMED ACM

Description	Phase Location	Quantity	Sample Number	Asbestos Content	Response Action	Refer. Photo
Transite siding	I	356 SF	NS	Assumed	3	2
Lab vacuum hoods (2)	I	80 SF	NS	Assumed	3	3
Lab oven gaskets	I	32 LF	NS	Assumed	2	4
Lab ovens (2)	I	48 SF	NS	Assumed	3	4
Insulated lab gloves	I	5 PR	NS	Assumed	2	3
Floor tile mastic	I	1,555 SF	NS	Assumed	3	5
Lab countertop	I	16 SF	NS	Assumed	3	None
12" ceiling tile	II	NA	9773SM001	ND	NA	None
Plaster fitting	II	56 EA	9773SM002	5% CH	2	Sim. 7
12" floor tile with mastic (M)	II	710 SF	9773SM003	1-3% CH (M)5% CH	3	8
12" floor tile with mastic (M)	II	710 SF	9773SM004	ND (M)1-3% CH	3	Sim. 8
12" floor tile with mastic (M)	II	QA/QC 9773SM004	9773SM004A	25% CH (M)TR/CH	3	Sim. 8
Plaster fitting	II	56 EA	9773SM005	10% CH	2	7
Plaster hanger	II	20 EA	9773SM006	5% CH	2	9
Plaster fitting	II	56 EA	9773SM007	10% CH	2	Sim. 7
12" floor tile with mastic (M)	II	NA	9773SM008	ND (M)ND	NA	None
2' x 4' ceiling tile	II	NA	9773SM009	ND	NA	None
Sprayed-on insulation	III	NA	9773SS001	ND	NA	None
Sprayed-on insulation	III	QA/QC 9773SS001	9773SS002	ND	NA	None

TABLE OF ALL SAMPLED MATERIALS AND ASSUMED ACM

Description	Phase Location	Quantity	Sample Number	Asbestos Content	Response Action	Refer. Photo
Plaster fitting	IV	NA	9773PA001	ND	NA	None
Plaster fitting	IV	NA	9773PA002	ND	NA	None
Plaster fitting	IV	290 EA	9773PA003	5% CH	2	13
Plaster fitting	IV	NA	9773PA004	ND	NA	None
9" floor tile	IV	NA	9773PA005	ND	NA	None
9" floor tile mastic	IV	13,000 SF	9773PA006	1-2% CH	3	14
Lab oven door gasket	IV	34 LF	9773PA007	50-60% CH	2	15
Lab table top and backing (B)	IV	NA	9773PA008	ND (B)ND	NA	None
12" floor tile with mastic (M)	IV	NA	9773PA009	ND (M)ND	NA	None
9" floor tile with mastic (M)	IV	13,000 SF	9773PA010	ND (M)3-5% CH	3	Sim. 14
9" floor tile with mastic (M)	IV	QA/QC 9773PA010	9773PA010A	TR/CH (M)25% CH	3	Sim. 14
Lab oven	IV	72 SF	NS	Assumed	3	15
Insulated lab gloves	IV	2 PR	NS	Assumed	2	None
Surface contamination	IV	2,160 SF	NS	Assumed	1	None
9" floor tile with mastic (M)	V	992 SF	9773PM001	ND (M)ND	NA	None
9" floor tile with mastic (M)	V	QA/QC 9773PM001	9773PM001A	20% CH (M) TR/CH	3	Sim. 17
Floor tile with mastic (M)	V	NA	9773PM002	<1% CH (M)ND	NA	None
Plaster fitting	V	NA	9773PM003	ND	NA	None
Sprayed-on ceiling	V	3,081 SF	9773PM004	2-4% CH	2	19
Board (3' x 5')	V	155 SF	9773PM005	70-80% CH	1	20

TABLE OF ALL SAMPLED MATERIALS AND ASSUMED ACM

Description	Phase Location	Quantity	Sample Number	Asbestos Content	Response Action	Refer. Photo
Pipe run	VI	NA	9773RA001	ND	NA	None
Plaster fitting	VI	NA	9773RA002	ND	NA	None
Plaster fitting	VI	NA	9773RA003	ND	NA	None
Mud on boiler	VI	NA	9773RA004	ND	NA	None
9" floor tile w/mastic (M) (under carpet)	VI	4,961 SF	9773RA005	<1% CH (M)ND	NA	Sim. 23
9" floor tile w/mastic (M) (under carpet)	VI	QA/QC 9773RA005	9773RA005A	12% CH (M)1% CH	3	Sim. 23
12" floor tile with mastic (M)	VI	120 SF	9773RA006	ND (M)3-5% CH	3	Sim. 27
12" floor tile with mastic (M)	VI	1,350 SF	9773RA007	ND (M)3-5% CH	3	Sim. 27
12" floor tile with mastic (M)	VI	900 SF	9773RA008	<1% CH (M)5% CH	3	Sim. 27
Plaster fitting	VI	285 EA	9773RA009	5% CH, <1% AM	2	29
Crawl space ground contamination	VI	3,510 SF	9773RA010	5% CH, 1% AM	1	25
Plaster fitting	VI	NA	9773RA011	ND	NA	None
Plaster fitting	VI	QA/QC 9773RA011	9773RA011A	ND	NA	None
Ceiling tile	VI	NA	9773RA012	ND	NA	None
Plaster fitting	VI	NA	9773RA013	ND	NA	None
Plaster fitting	VI	QA/QC 9773RA013	9773RA013A	ND	ND	None
Boiler covering	VI	NA	9773RA014	ND	ND	None
Boiler covering	VI	QA/QC 9773RA014	9773RA014A	ND	ND	None
Lab vacuum hoods	VI	176 SF	NS	Assumed	3	26

TABLE OF ALL SAMPLED MATERIALS AND ASSUMED ACM

Description	Phase Location	Quantity	Sample Number	Asbestos Content	Response Action	Refer. Photo
Plaster fitting	VII	NA	9773RM001	ND	NA	None
Plaster fitting	VII	NA	9773RM002	ND	NA	None
Plaster hanger	VII	NA	9773RM003	ND	NA	None
Floor tile with mastic (M)	VII	NA	9773RM004	ND (M)ND	NA	None

LEGEND

AM = Amosite asbestos
CH = Chrysotile asbestos
NS = Not sampled
NA = Not applicable
ND = Not detected
TR = Trace
Sim = Similar to

RESPONSE ACTIONS AND RECOMMENDATIONS

RESPONSE ACTIONS AND RECOMMENDATIONS

One of three response actions will be recommended for each ACM and assumed ACM: immediate, short term, or long term. The selection of the response action will be dependent upon the asbestos containing materials' condition, damage, friability, exposed surface area, accessibility, the activity and movement in the area, and the presence or absence of an air plenum or direct air stream.

Response Action No. 1 - Immediate (0-60 Days)

Immediately isolate the area and restrict access to the material. Repair damaged ACM and remove as soon as possible. An asbestos abatement program needs to be implemented as required for major renovation or demolition under NESHAP (National Emissions Standard for Hazardous Air Pollutants). An Operations and Maintenance plan needs to be implemented until all ACM has been removed from the building.

Response Action No. 2 - Short Term (60 Days - 1 Year)

Restrict access to the material and repair damaged ACM as soon as possible. An Operations and Maintenance plan needs to be implemented until all ACM has been removed from the building. At the time of removal, major renovation or demolition, an asbestos abatement program will need to be implemented as required under NESHAP (National Emissions Standard for Hazardous Air Pollutants).

Response Action No. 3 - Long Term (Over 1 Year)

An Operations and Maintenance plan needs to be implemented until all ACM has been removed from the building. At the time of removal, major renovation or demolition, an asbestos abatement program will need to be implemented as required under NESHAP (National Emissions Standard for Hazardous Air Pollutants).

Recommended Remedial Techniques

The following alphabetic designations will be used with the response actions in the tables contained within the area description section to identify recommended remedial techniques.

GR - Gross Removal
GB - Glovebag Removal
MG - Modified Glovebag Removal
CR - Crawlspace Removal
OM - Operation/Maintenance

The repair and removal of ACM must be carried out by qualified Maintenance Personnel or Contractors who have been prequalified by the State of Idaho Division of Public Works who has adopted a Contractor accreditation plan under Section 206(b) of Title II of the Toxic Substances Control Act, or is accredited by an EPA-approved course under Section 206(c) of the Act (40 CFR 763.93 (e)(7)).

Basic requirements include EPA accredited worker certification for personnel involved in ACM repair and removal, and "Competent Person" certification for all supervisory personnel.

AREA DESCRIPTIONS

AREA DESCRIPTIONS

Phase I - Shoshone, Idaho

Shoshone Administration Building (Laboratory and Loading Dock)

The Shoshone Administration Building is a single story brick, concrete block and wood frame structure with a subgrade basement and asphalt roof (see Ref. Dwg. Nos. 1 & 2 and Ref. Photograph Nos. 1 & 2). The Administration Building has undergone several remodeling projects and additions with an extensive abatement of the asbestos thermal systems pipe insulation throughout the building. MK scope of work included the materials found in the laboratory and the adjacent loading dock located on the northwest side of the building (see Ref. Photograph No. 2). MK consultants were directed by DPW representatives that the building was considered asbestos-free and no destructive sampling was to be performed. This, along with the recent remodel, accounts for the assumed list of materials in the table below and the absence of bulk material sample analyses for the materials suspected of containing asbestos. MK recommends that the lab oven door gaskets and insulated lab gloves quantified in the table below be remediated as soon as possible.

The Administration Building was divided into two areas for quantification and assessment purposes:

- A - Basement
- B - First Floor

The following table lists those materials in Areas A and B of Phase I that contain or are assumed to contain asbestos.

Existing and Assumed ACM for Areas A and B of Phase I

Description	Quantity	Area	Refer. Sample	Asbestos Content	Response Action	Refer. Photo	Ref. Floor Plans
Transite siding (loading dock)	356 SF	B	NS	Assumed	3, GR	2	2
Lab vacuum hoods(2)	80 SF	B	NS	Assumed	3, OM	3	2
Lab ovens (2)	48 SF	B	NS	Assumed	3, OM	4	2

Description	Quantity	Area	Refer. Sample	Asbestos Content	Response Action	Refer. Photo	Ref. Floor Plans
Lab oven gaskets	32 LF	B	NS	Assumed	2, GR	4	2
Insulated lab gloves	5 PR	B	NS	Assumed	2, GR	3	2
*12" floor tile mastic	1,555 SF	A,B	NS	Assumed	3, OM	5	2
Lab countertop	16 SF	B	NS	Assumed	3, OM	None	2

*The basement, hallway and foyer areas of the Administration Building were not included in the Scope of Work at Shoshone, Idaho. Therefore, 1,450 SF of this quantity (Areas A and B) is outside of the Scope of Work.

No other accessible building materials are suspected of containing asbestos.

Phase II - Shoshone, Idaho

Shoshone Service Maintenance Shop Building

The Shoshone Maintenance Shop Building is a concrete block and wood frame structure with asphalt roof and concrete slab floor (see Ref. Dwg. Nos. 1 & 3 and Ref. Photograph No. 6). The building houses work bays, parts/supply storeroom, offices, employee break room, restrooms, and machinist shop.

The Service Maintenance Shop was divided into four areas for quantification and assessment purposes:

- A - Garage Service Maintenance
- B - Parts Supply Office and Storage
- C - Break Room, Hallway and Restrooms
- D - Mechanical Room

The following table lists those materials in Areas A-D of Phase II that contain or are assumed to contain asbestos.

Existing and Assumed ACM for Areas A-D of Phase II

Description	Quantity	Area	Refer. Sample	Asbestos Content	Response Action	Refer. Photo	Ref. Floor Plans
12" floor tile w/ mastic (M)	710 SF	C	9773SM003, 9773SM004, 9773SM004A	1-3% CH, (M)5% CH; (M)1-3% CH, 25% CH, (M)TR/CH	3, GR	8	3
Plaster fittings/ hangers	76 EA	A,B, C,D	9773SM002, 9773SM005, 9773SM006, 9773SM007	5% CH, 10% CH, 5% CH, 10% CH	2, GB	7,9	3

No other accessible building materials are suspected of containing asbestos.

Phase III - Shoshone, Idaho

Shoshone Sign Shop Storage Building

The Shoshone Sign Shop Storage Building is a single story Quonset hut with corrigated metal siding and roof, setting on concrete stem walls and a concrete floor (see Ref. Dwg. No. 1 and Ref. Photograph No. 10). The building is being used to store signs, building materials and equipment. Patches are all that remain of a sprayed-on cellulose insulating material which was applied to the underside of the corrigated metal. This material was sampled and tested nonasbestos (see Sample Nos. 9773SS001 and 9773SS002).

No other accessible building materials are suspected of containing asbestos.

Phase IV - Pocatello, Idaho

Pocatello Administration Building

District 05 Pocatello Administration Building is a concrete block and brick frame structure with asphalt built-up roof, concrete floor, and a concrete mechanical tunnel which encircles the perimeter of the building (see Ref. Dwg. Nos. 4 & 5 and Ref. Photograph Nos. 11 & 12). The building houses administration and design engineering offices and engineering labs. MK recommends that the lab oven door gaskets and insulated lab gloves quantified in the table below be remediated as soon as possible.

The Administration Building was divided into three areas for quantification and assessment purposes:

- A – Main floor offices and engineering labs
- B – Boiler room
- C – Mechanical tunnels

Most room ex. lab have carpet probably over ACM ECA to go

The following table lists those materials in Areas A-C contain or are assumed to contain asbestos.

Existing and Assumed ACM for Areas A-C of Phase IV

Description	Quantity	Area	Refer. Sample	Asbestos Content	Response Action	Refer. Photo	Ref. Floor Plans
Plaster fitting	290 EA	B,C	9773PA003	5% CH	2, GB	13	5
9" floor tile mastic	13,000 SF	A	9773PA006, 9773PA010, 9773PA010A	1-2% CH, 3-5% CH, 25% CH	3, GR	14	5
Lab oven door gasket	34 LF	A	9773PA007	50-60% CH	2, GR	15	5
Insulated lab gloves	2 PR	A	NS	Assumed	2, GB	None	5
Lab oven	72 SF	A	NS	Assumed	3, OM	15	5
Surface contam. (throughout crawlspace)	2,160 SF	C	NS	Assumed	1, GR	None	5

No other accessible building materials are suspected of containing asbestos.

Phase V – Pocatello, Idaho

Pocatello Service Maintenance Shop Building

The District 05 Maintenance Shop is a concrete block frame structure with concrete floor and precast concrete T-beam ceiling with asphalt roof (see Ref. Dwg. Nos. 4 & 6 and Ref. Photograph No. 16). The building houses work bays, parts/supply storeroom, offices, employees break room, restrooms, and machinist shop. MK recommends that the 3' x 5' board quantified in the table below be remediated as soon as possible.

MK has divided the Service Maintenance Shop Building into three areas for quantification and assessment purposes:

- A - Shop Office and Garage Service
- B - Parts/Supply Office and Storage
- C - Break Room, Hallway, Janitor Closet, and Restrooms

The following table lists those materials in Areas A-C of Phase V that contain or are assumed to contain asbestos.

Existing and Assumed ACM for Areas A-C of Phase V

Description	Quantity	Area	Refer. Sample	Asbestos Content	Response Action	Refer. Photo	Ref. Floor Plans
9" floor tile	992 SF	C	9773PM001A	20% CH	3, GR	17	6
Sprayed-on ceiling	3,081 SF	A,B	9773PM004	2-4% CH	2, GR	18,19	6
Board (3' x 5')	15 SF	A	9773PM005	70-80% CH	1, GB	20	6

No other accessible building materials are suspected of containing asbestos.

Phase VI - Rigby, Idaho

Rigby Administration Building

District 06 Administration Building is a concrete block and brick frame structure which houses district offices, engineering design and engineering labs (see Ref. Dwg. Nos. 7 & 8 and Ref. Photograph Nos. 21 & 22). The building was constructed in two phases. The original building is a single story structure with asphalt roof and light aggregate floor over subgrade crawlspace. The crawlspace has a dirt floor which is covered with construction and ACM debris and is accessed from the boiler room. The steam heat for the original building is provided by a gas-fired boiler located in the boiler room on the southeast side of the building. The heating system supply and return lines are insulated with fiberglass on the straight runs and hard plaster on the fittings. The 1975 south wing or addition is a one-story structure with asphalt roof and basement. Two transite vacuum hoods are located in the lab area between the mens restroom and asphalt lab.

The Administration Building was divided into four areas for quantification and assessment purposes:

- A - Original Building
- B - Crawlspace and Boiler Room
- C - Addition (First Floor)
- D - Addition (Basement)

The following table lists those materials in Areas A-D of Phase VI that contain or are assumed to contain asbestos.

Existing and Assumed ACM for Areas A-D of Phase VI

Description	Quantity	Area	Refer. Sample	Asbestos Content	Response Action	Refer. Photo	Ref. Floor Plans
9" floor tile (under carpet)	4,961 SF	A	9773RA005A	12% CH	3, GR	Sim. 27	8
Floor tile mastic	2,370 SF	A,C D	9773RA006, 9773RA007, 9773RA008	3-5% CH, 3-5% CH, 5% CH	3, GR	Sim. 27	8,9
Plaster fitting	285 EA	B	9773RA009	5% CH <1% AM	2, GB	24	9
Ground contam. (1" to 2" depth)	3,510 SF	B	9773RA010	5% CH, 1% AM	1, G	25	8
Lab vacuum hood	176 SF	A	NS	Assumed	3, OM	26	8

No other accessible building materials are suspected of containing asbestos.

Phase VII - Rigby, Idaho

Rigby Service Maintenance Shop Building

The District 06 Maintenance Shop is a concrete block and wood frame structure with concrete floor and precast concrete T-beam ceiling with asphalt roof (see Ref. Dwg. Nos. 7 & 10 and Ref. Photograph No. 30). The building houses service work bays, parts/supply storeroom, offices, employees break room, locker/restrooms, and machinist shop. The Boiler Room has undergone an extensive abatement of the asbestos thermal systems pipe insulation. The

thermal system fittings and hangers were sampled and analyzed as having no detectable asbestos content. The floor tile and mastic was also sampled and lab analysis reported that neither the tile nor mastic had a detectable content level of asbestos.

PRELIMINARY COST ESTIMATE

PRELIMINARY COST ESTIMATES

In consideration of DPW's ongoing abatement program to maintain a healthful working environment for building occupants and maintenance personnel, by systematically ridding its facilities of friable forms of asbestos, MK has provided a preliminary cost estimate for the removal of all friable ACM discovered in the survey.

The following cost estimate includes all friable asbestos-containing materials from Phases I, II, III, IV, V, VI, and VII. The costs assume a total estimate of 55 abatement days to complete the removal phase.

SHOSHONE, IDAHO

Phase II - Service Maintenance Shop Building

Fittings/hangers	$ 2,660.00
Mobilization/air monitoring/disposal (by abatement contractor)	800.00
Insurance/overhead/profit	1,000.00
	4,460.00
Contingency	540.00
	$ 5,000.00

Estimated 5-10 abatement days

POCATELLO, IDAHO

Phase IV - Administration Building/Maintenance Shop

Plaster fittings	$10,920.00
Mech. tunnel floor contamination (Administration Bldg.)	3,240.00
Ceiling spray-on (Maintenance Shop)	15,155.00
Mobilization/air monitoring/disposal (by abatement contractor)	6,742.00
Insurance/overhead/profit	9,014.00
	45,071.00
Contingency	4,507.00
	$49,578.00

Estimated 20-25 abatement days

RIGBY, IDAHO

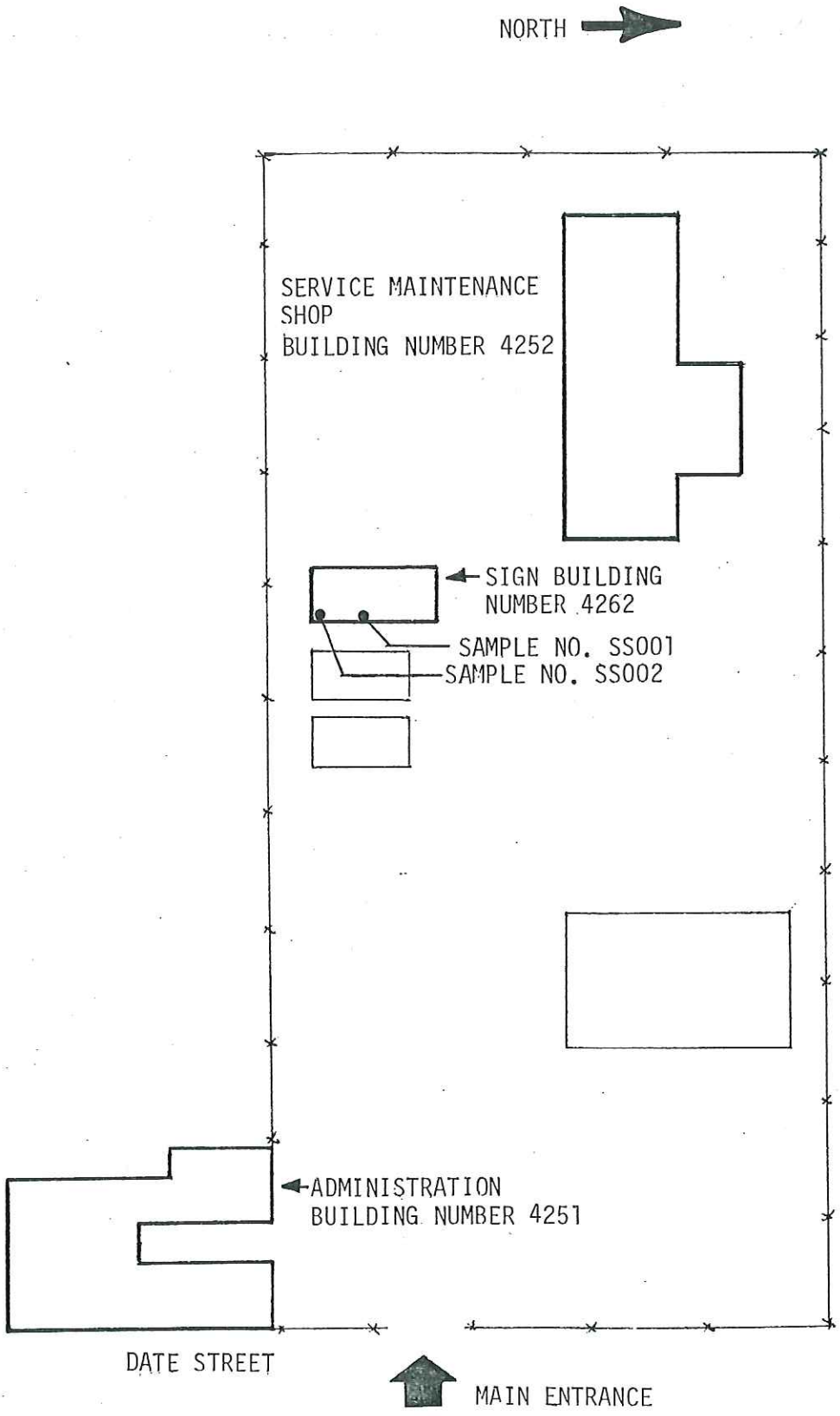
Phase VI - Administration Building

Plaster fittings	7,980.00
Crawlspace contamination/construction debris	5,265.00
Mobilization/air monitoring/disposal (by contractor)	3,046.00
Insurance/overhead/profit	4,073.00
	20,364.00
Contingency	2,036.00
	$22,400.00

Estimated 15-20 abatement days

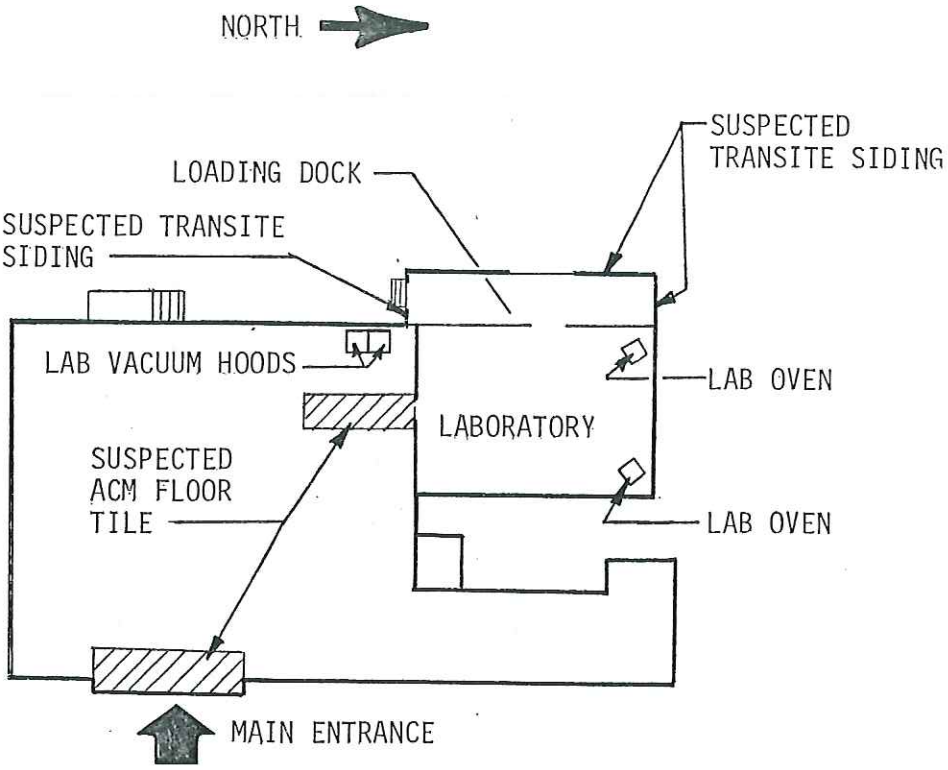
SECTION II

REFERENCE FLOOR PLANS

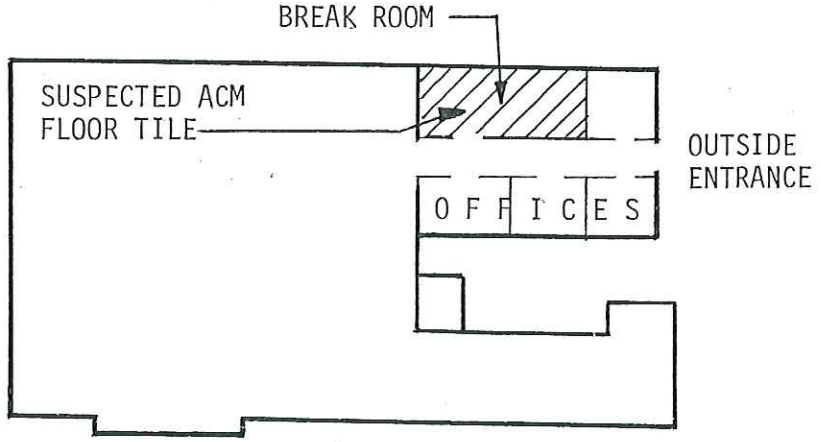


SITE PLAN

DRAWING NO. 1
SITE PLAN
IDAHO TRANSPORTATIOI
DEPARTMENT
SHOSHONE, IDAHO

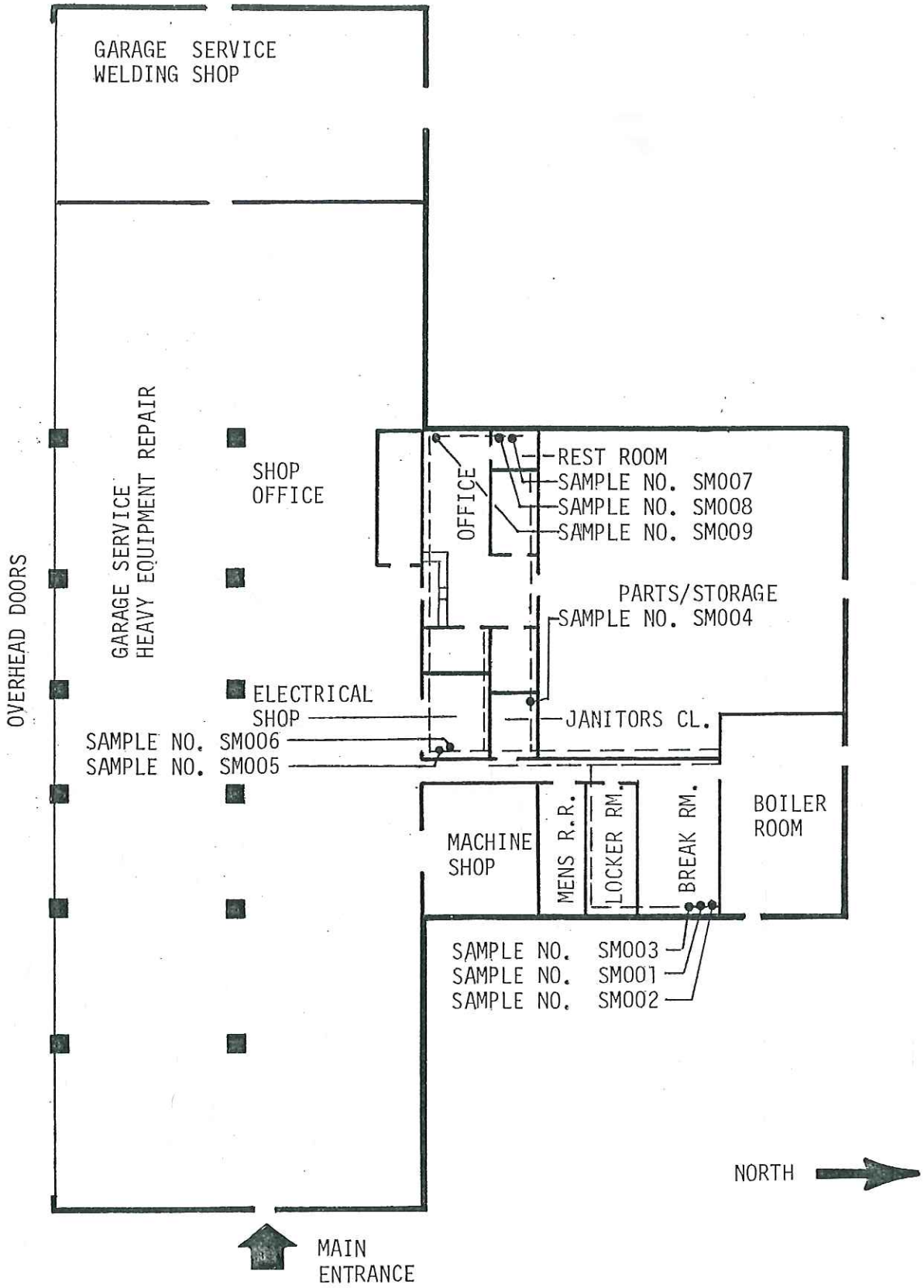


FIRST FLOOR

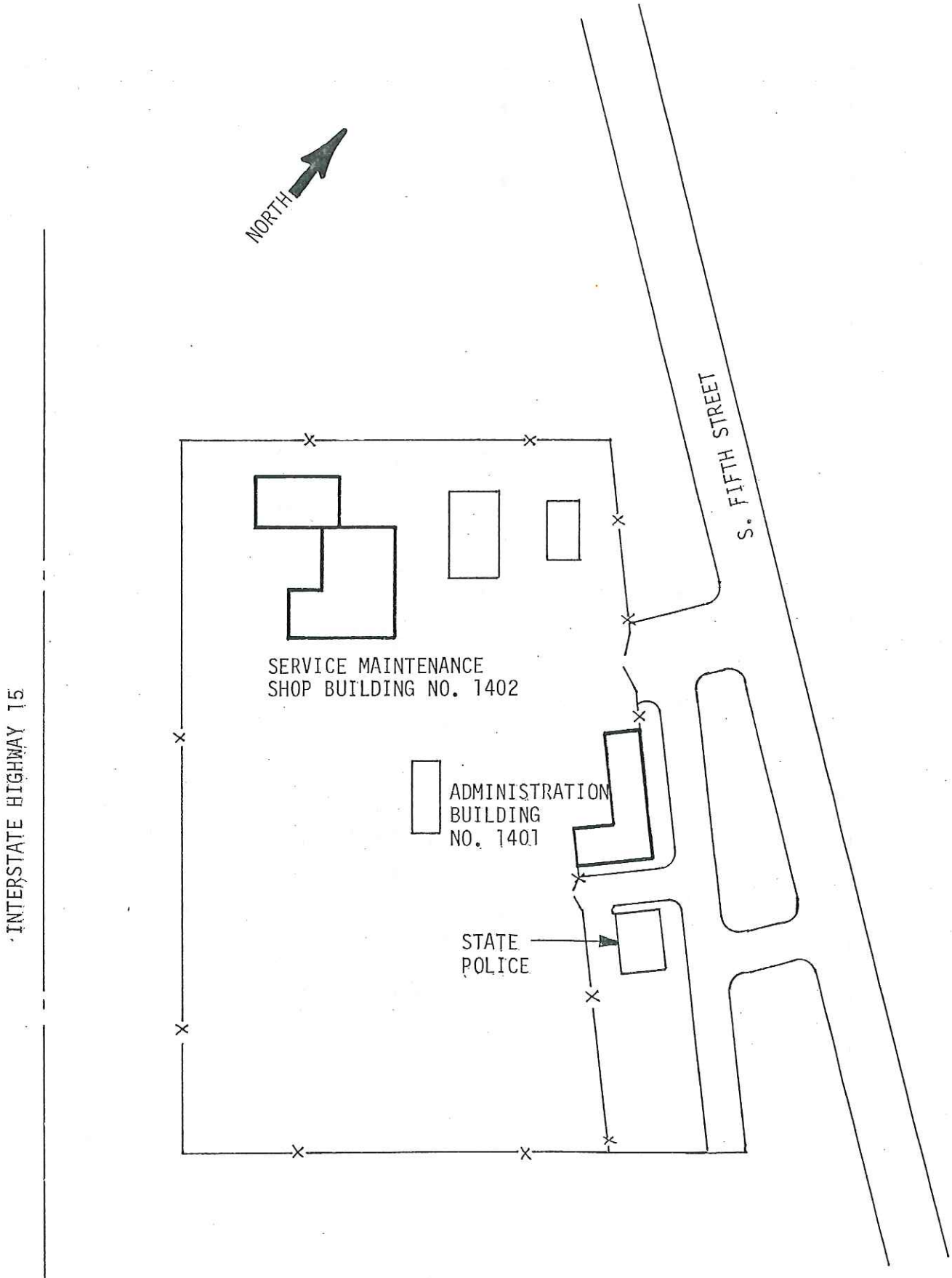


BASEMENT

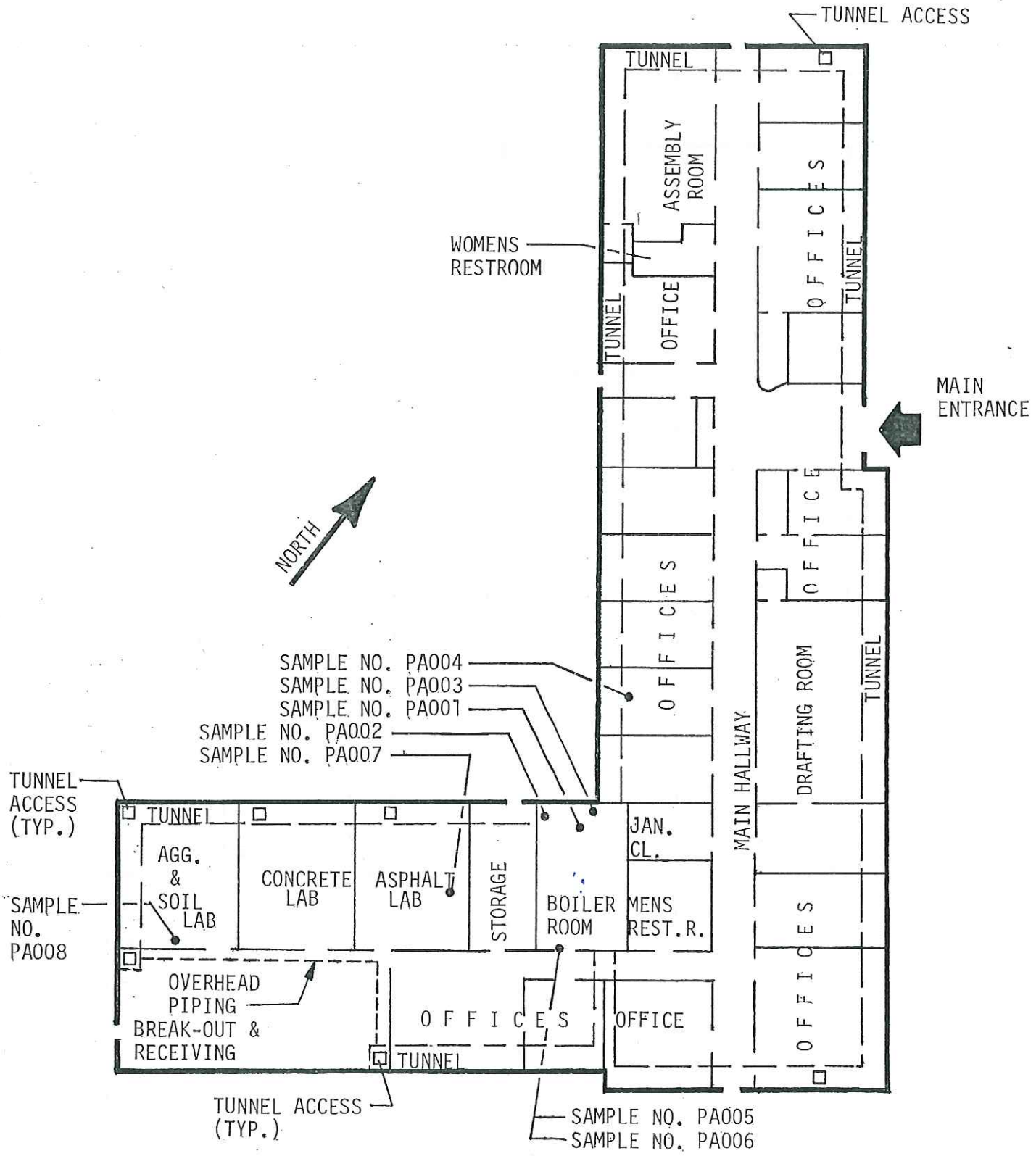
DRAWING NO. 2
ADMINISTRATION BUILDING
NUMBER 4251
SHOSHONE, IDAHO



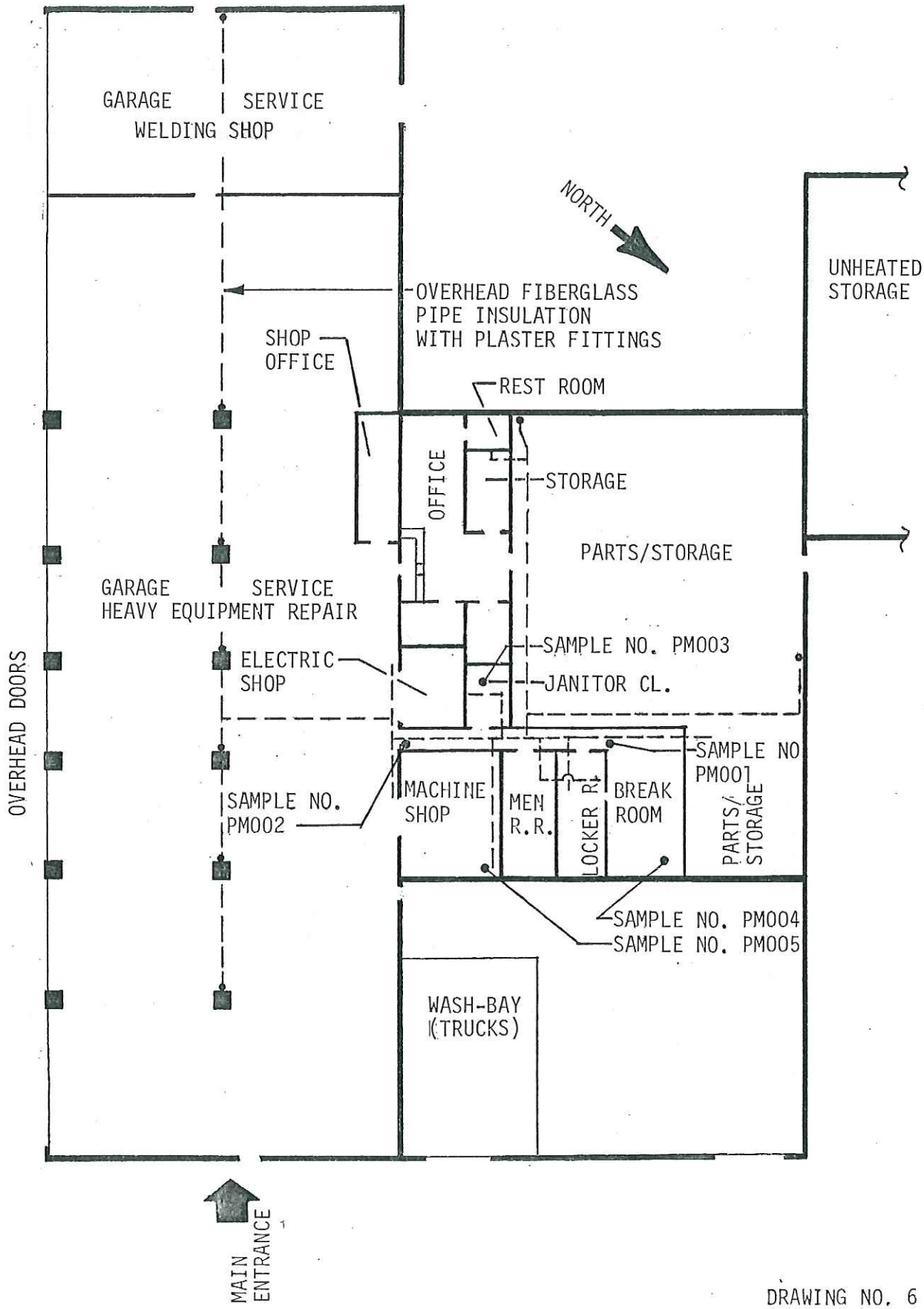
DRAWING NO. 3
SERVICE MAINTENANCE
SHOP BUILDING
NUMBER 4252
SHOSHONE, IDAHO



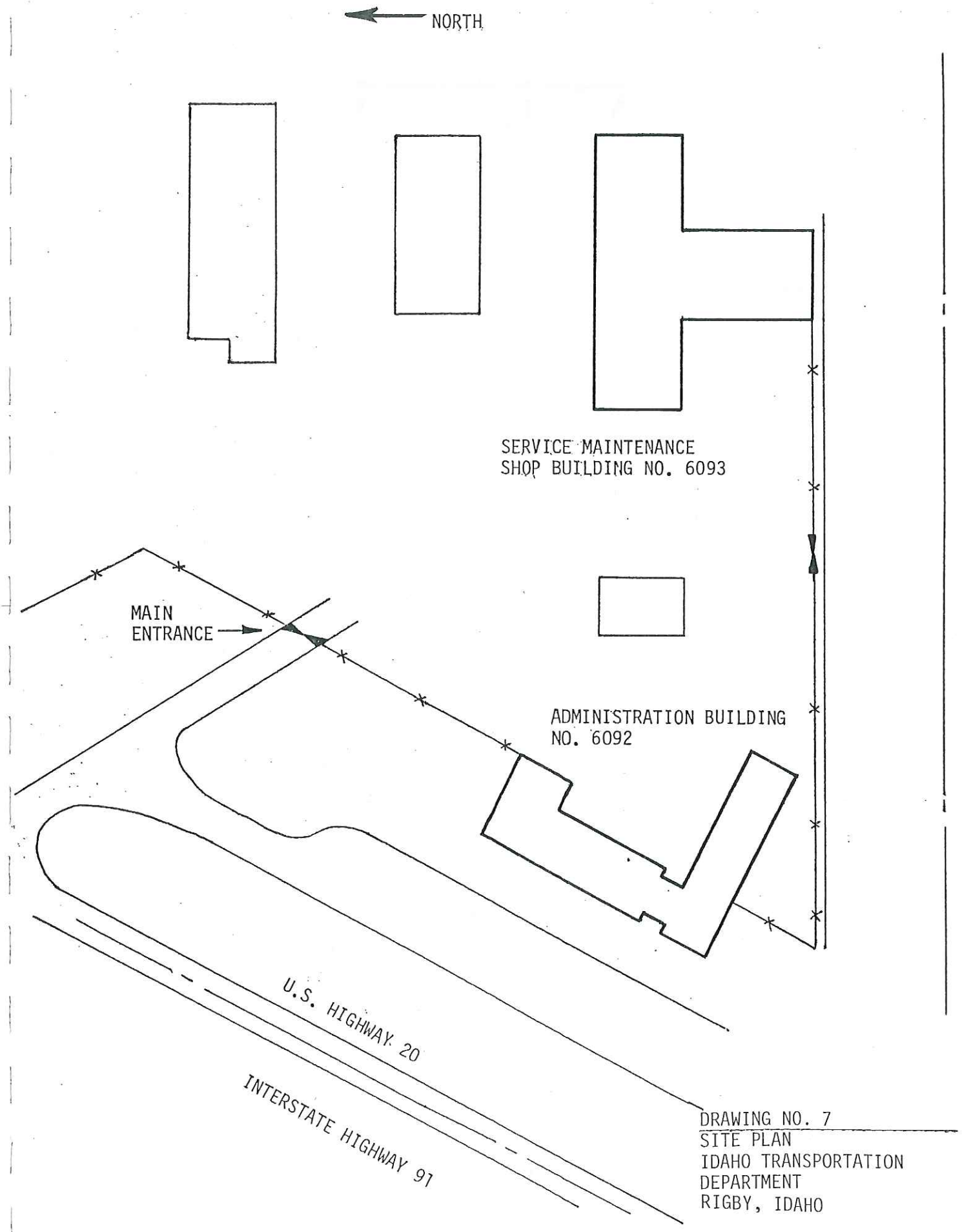
DRAWING NO. 4
SITE PLAN
IDAHO TRANSPORTATION
DEPARTMENT
POCATELLO, IDAHO



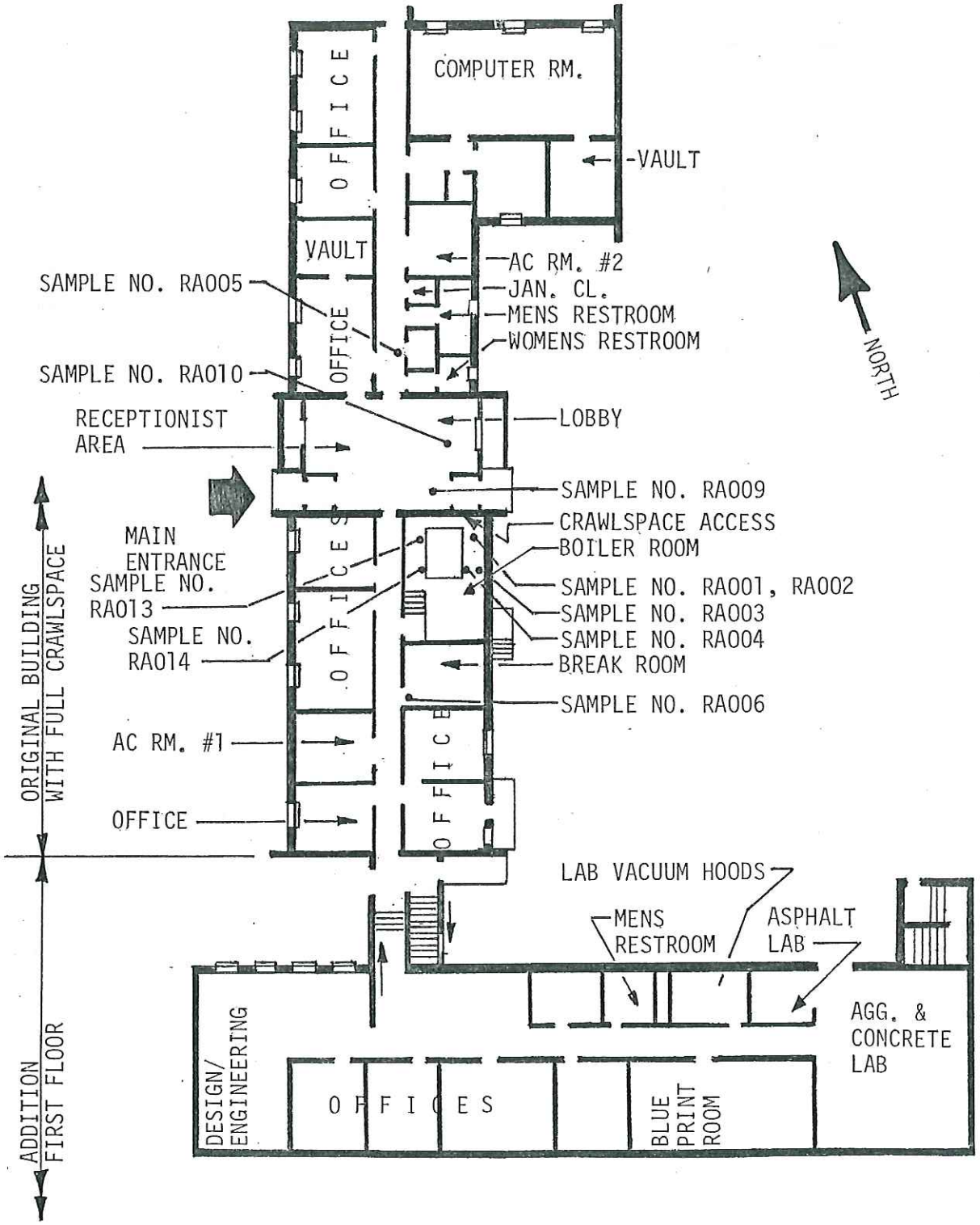
DRAWING NO. 5
ADMINISTRATION BUILDING
NUMBER 1401
POCATELLO, IDAHO



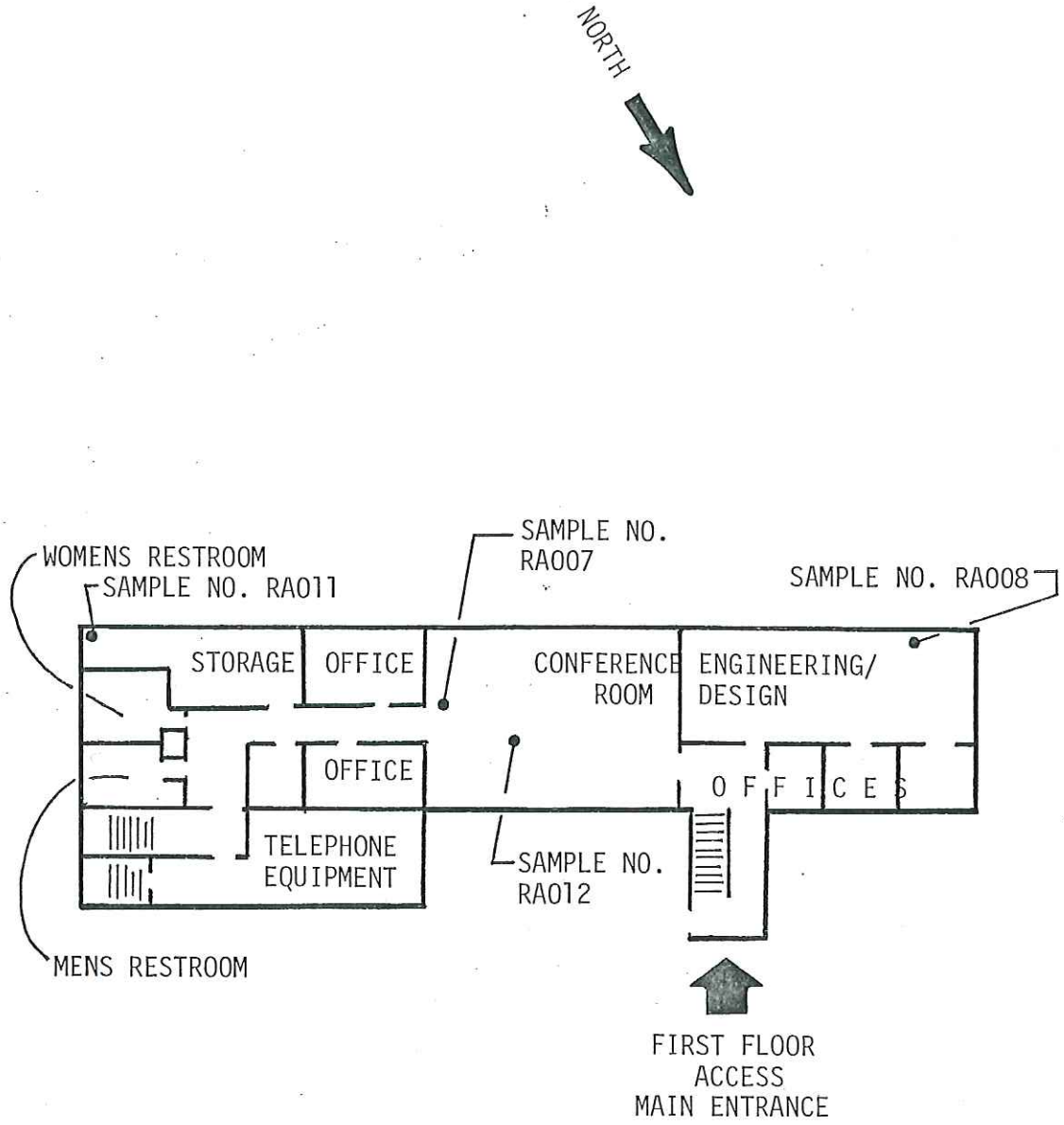
DRAWING NO. 6
SERVICE MAINTENANCE
SHOP BUILDING
NUMBER 1402
POCATELLO, IDAHO



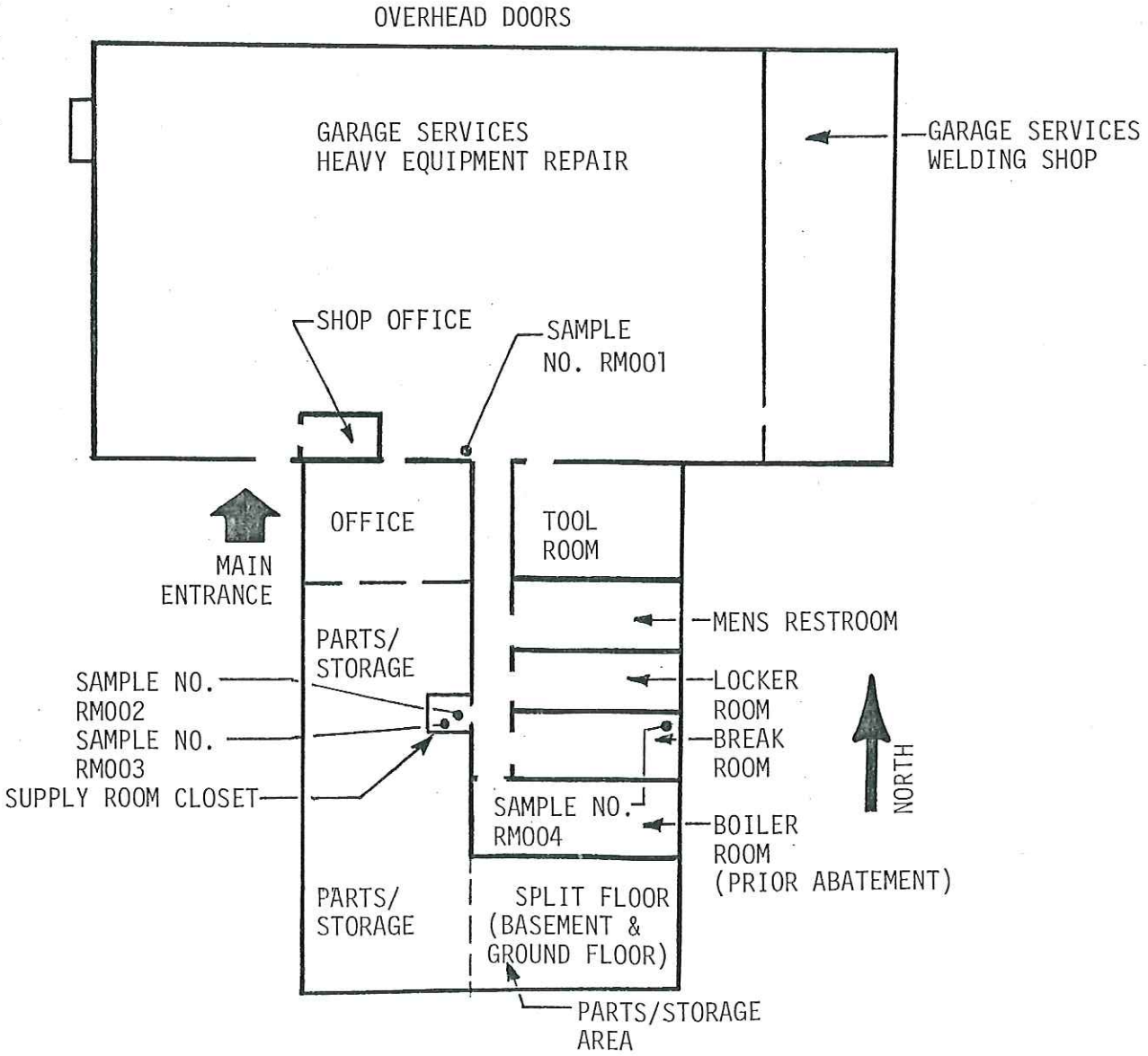
DRAWING NO. 7
SITE PLAN
IDAHO TRANSPORTATION
DEPARTMENT
RIGBY, IDAHO



DRAWING NO. 8
ADMINISTRATION
BUILDING NO. 6092
RIGBY, IDAHO



DRAWING NO. 9
BASEMENT - ADDITION
ADMINISTRATION BUILDING
NO. 6092
RIGBY, IDAHO



DRAWING NO. 10
SERVICE MAINTENANCE SHOP
BUILDING NO. 6093
RIGBY, IDAHO

PHOTOGRAPHIC DOCUMENTATION

DPW PROJECT # 1999-9773

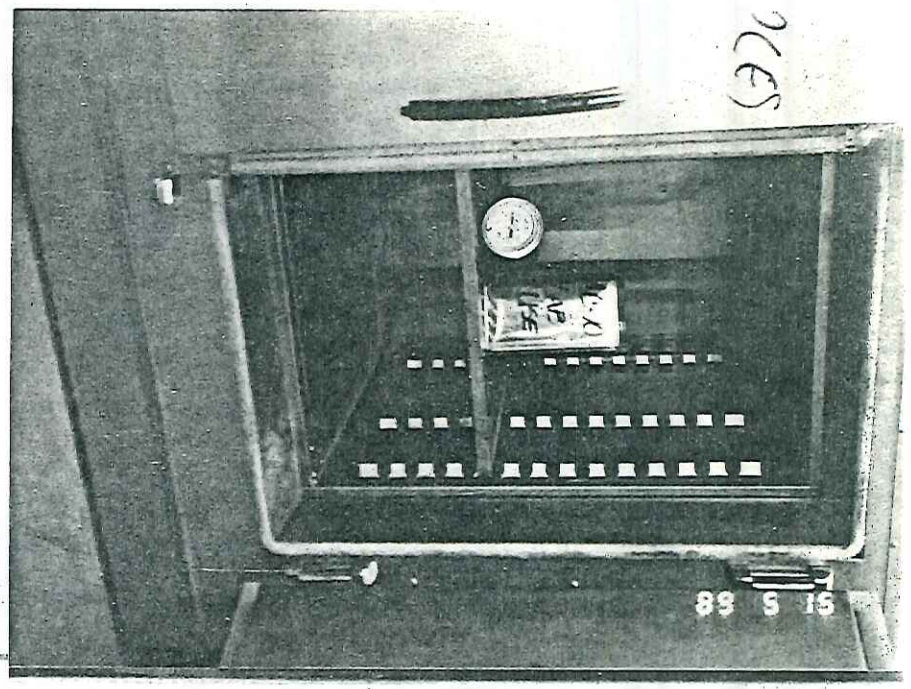
PHASE I - SHOSHONE ADMINISTRATION BUILDING NO. 4251
Photographs (Clockwise from right)

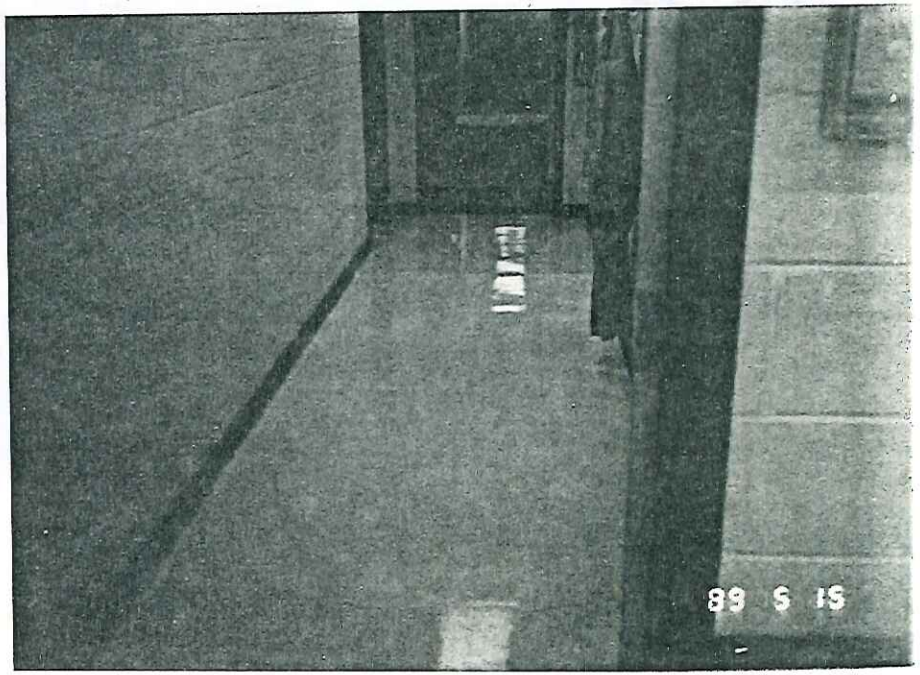
4 Lab Oven and Lab Oven Door Gasket

5 Hallway - Floor Tile and Mastic

PHASE II - SHOSHONE SERVICE MAINTENANCE SHOP
BUILDING NO. 6093

6 Southeast corner of building





DPW PROJECT # 1999-9773

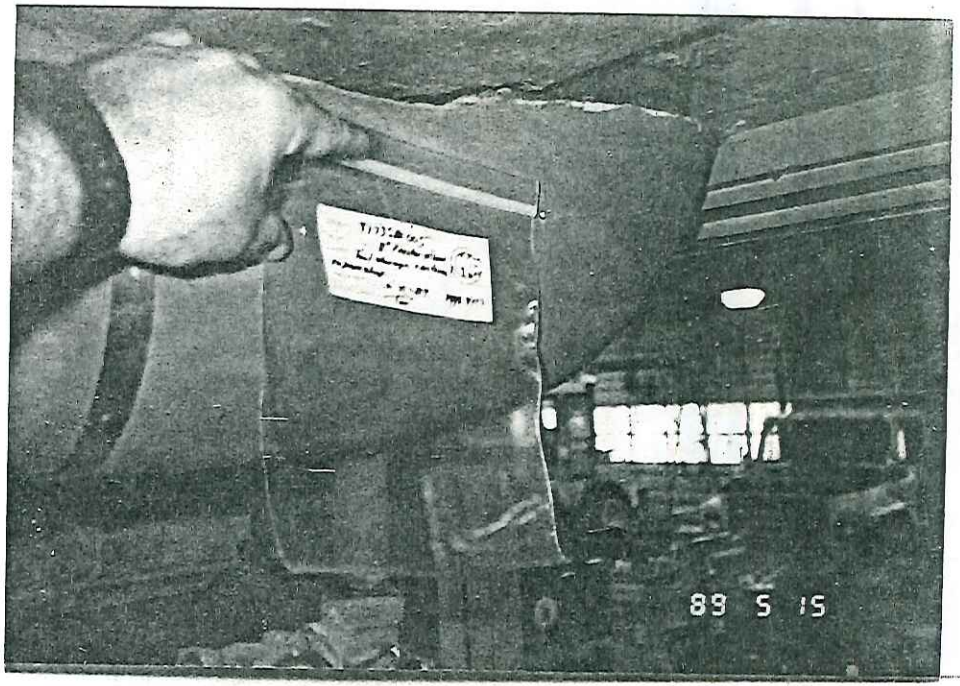
PHASE II - SHOSHONE SERVICE MAINTENANCE SHOP
BUILDING NO. 6093

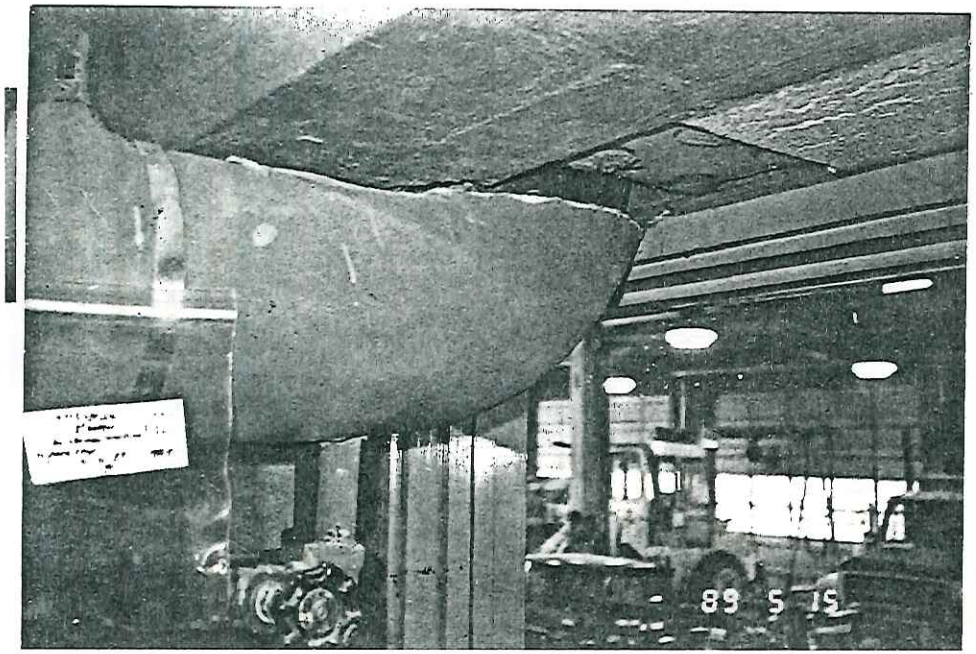
Photographs (Clockwise from right)

7 Tool Room - Plaster Fitting, 12' above floor (SM005)

8 Break Room - 12" Floor Tile and Mastic (SM003)

9 Tool Room - Plaster Hanger, 12' above floor (SM006)





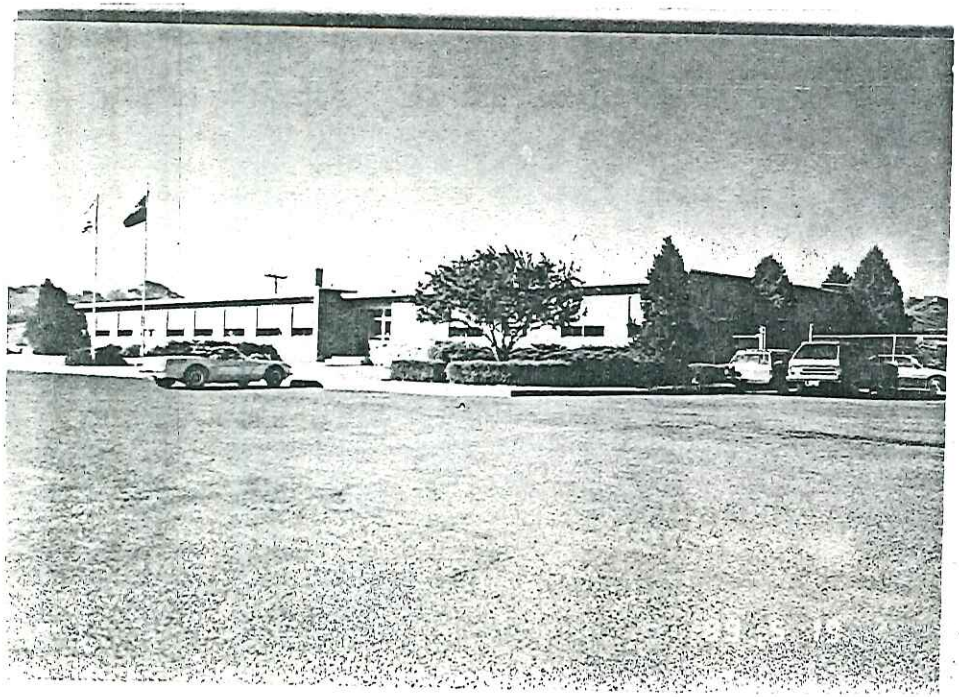
DPW PROJECT # 1999-9773

PHASE III - SHOSHONE SIGN SHOP BUILDING NO. 4262
Photographs (Clockwise from right)

10 Main Entrance into Sign Shop

PHASE IV - POCATELLO ADMINISTRATION BUILDING NO. 1401

11 East side of building - Main Entrance at right side of photograph
12 North side of building - Main Entrance



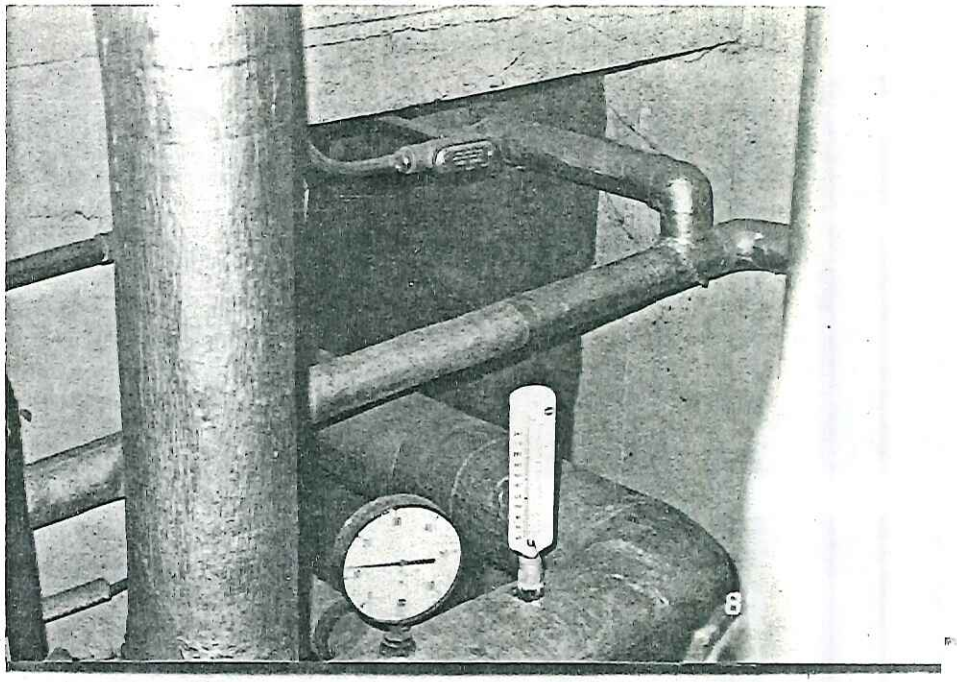
DPW PROJECT # 1999-9773

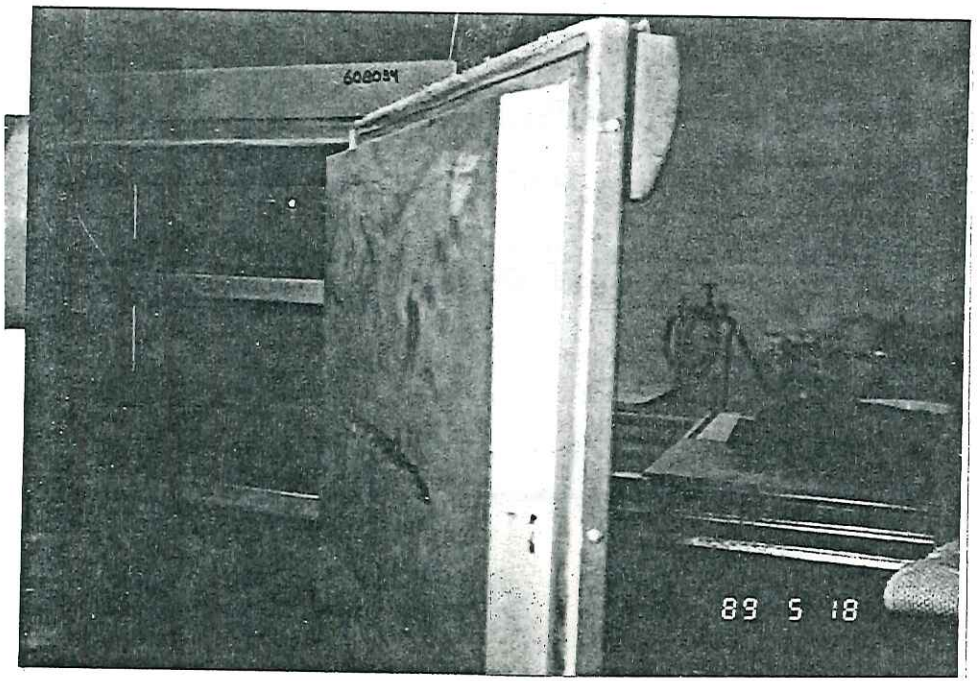
PHASE IV - POCATELLO ADMINISTRATION BUILDING NO. 1401
Photographs (Clockwise from right)

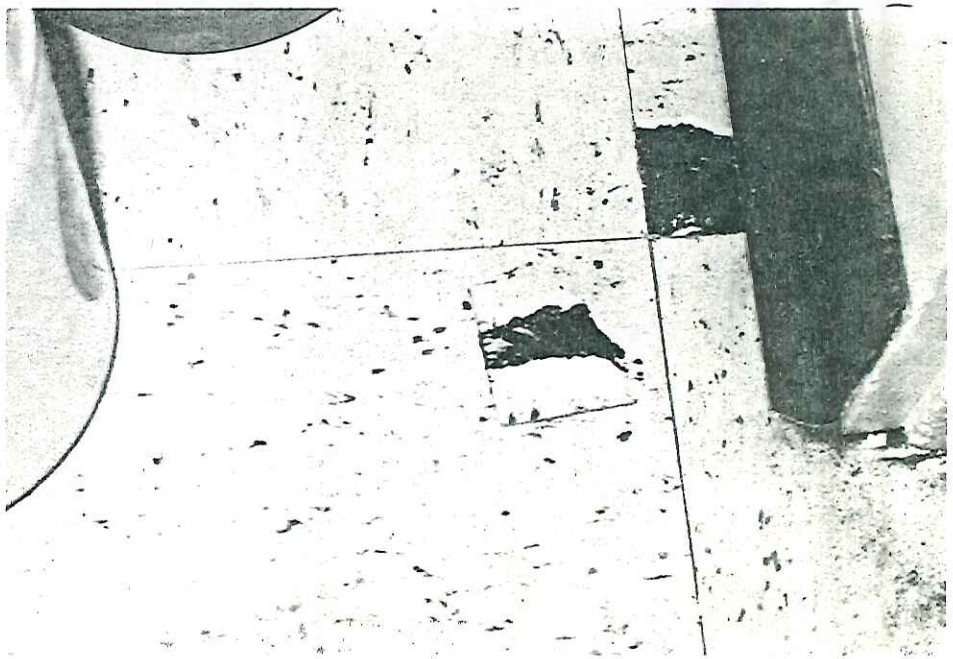
13 Boiler Room - Crawlspace Entrance, Typical Plaster Fittings (PA003)

14 Hallway - 9"Floor Tile and Mastic (PA010)

15 Laboratory - Lab Oven and Lab Oven Door Gasket (PA007)







DPW PROJECT # 1999-9773

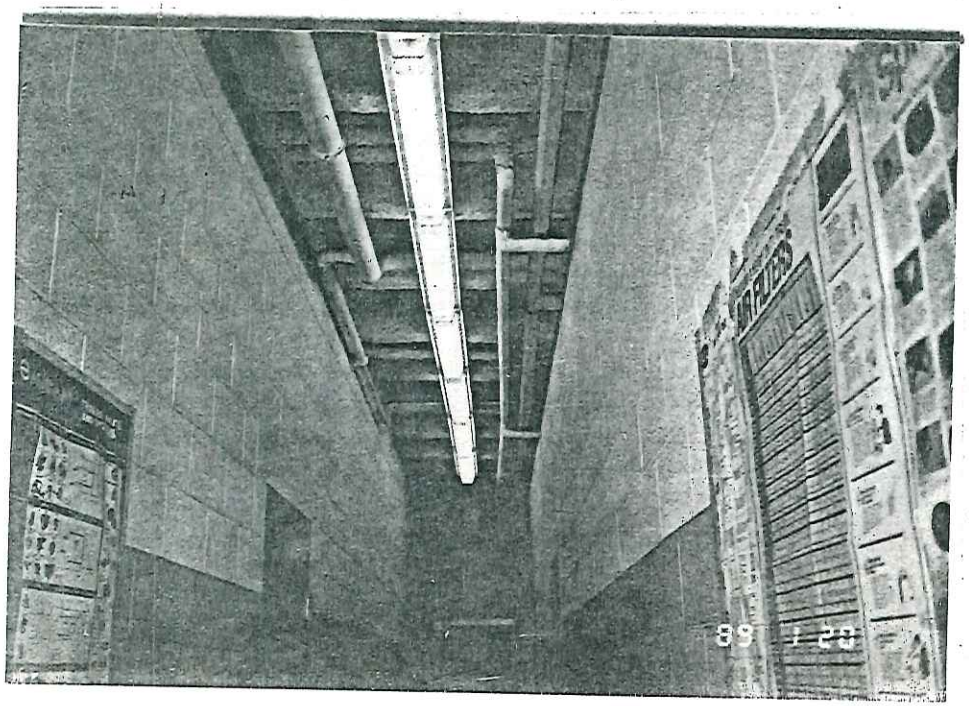
PHASE V - POCATELLO SERVICE MAINTENANCE SHOP
BUILDING NO. 1402

Photographs (Clockwise from right)

16 East side of building

17 Break Room and Hallway - 9" Floor Tile and Mastic (PM001A)

18 Sprayed-on Ceiling in Hallway. Obvious over-spray on TSI. Typical of Sprayed-on Ceiling.



DPW PROJECT # 1999-9773

PHASE V - POCATELLO SERVICE MAINTENANCE SHOP
BUILDING NO. 1402

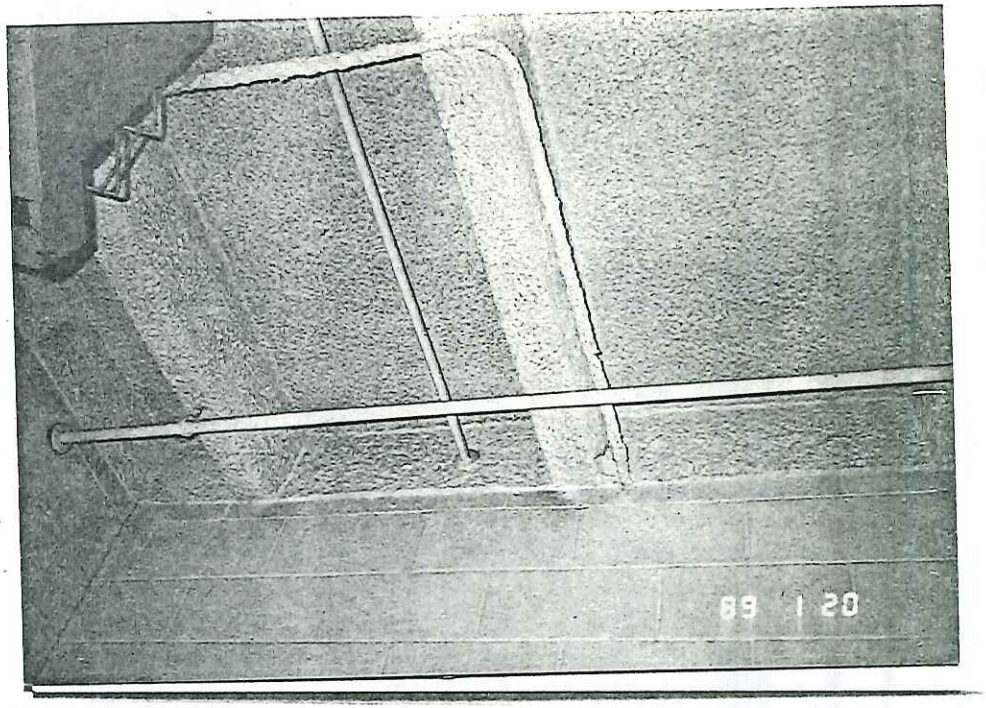
Photographs (Clockwise from right)

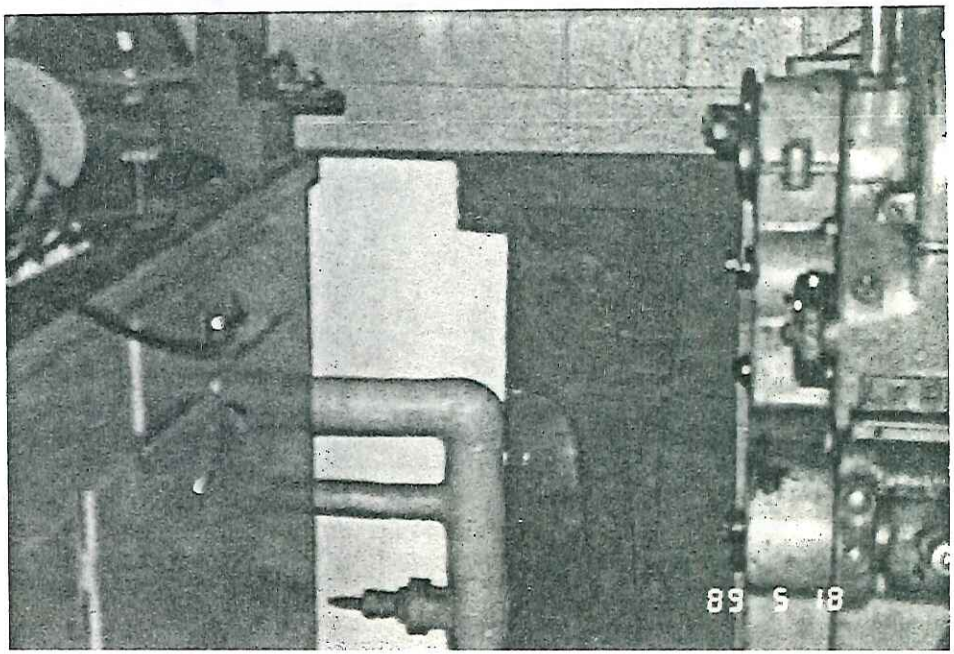
19 Break Room - Sprayed-on Ceiling with obvious overspray (PM004)

20 Lathe Room - White ACM Board (PM005)

PHASE VI - RIGBY ADMINISTRATION BUILDING NO. 6092

21 Southwest corner of building





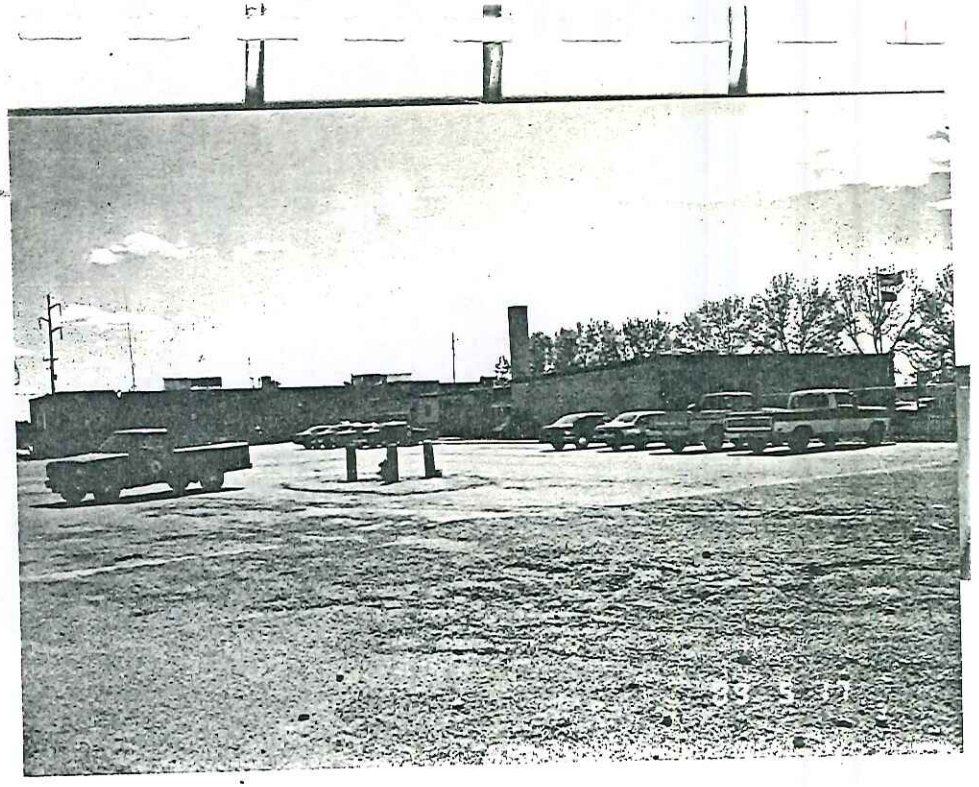
DPW PROJECT # 1999-9773

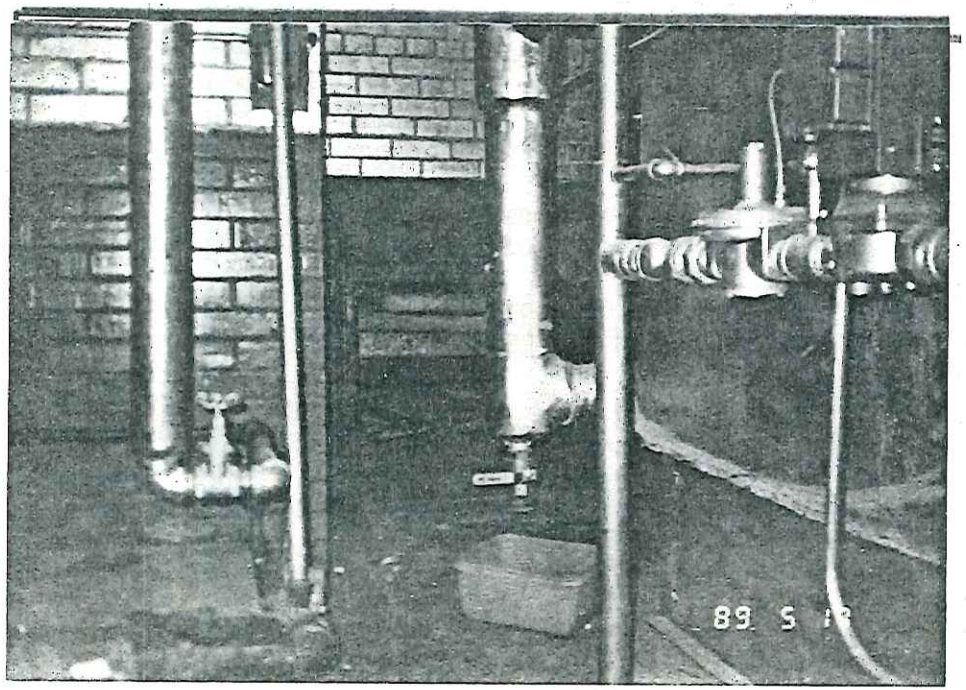
PHASE VI - RIGBY ADMINISTRATION BUILDING NO. 6092
Photographs (Clockwise from right)

22 Northeast view of building - Original building on right side of photo

23 Janitors closet - 9" floor Tile and Mastic (RA005)

24 Boiler Room - Crawlspace Access, visible construction debris





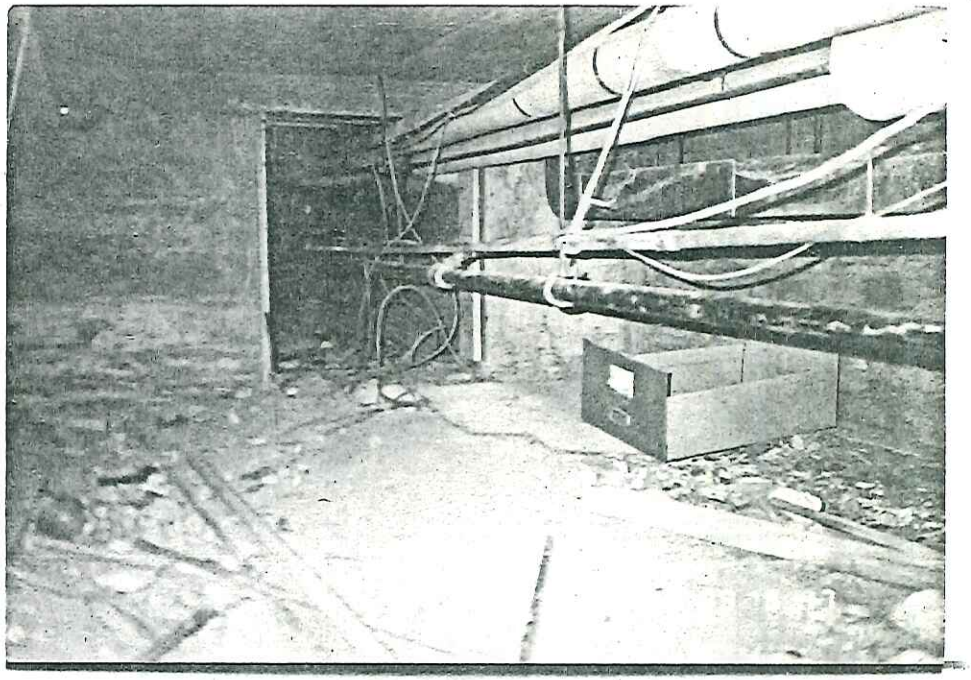
DPW PROJECT # 1999-9773

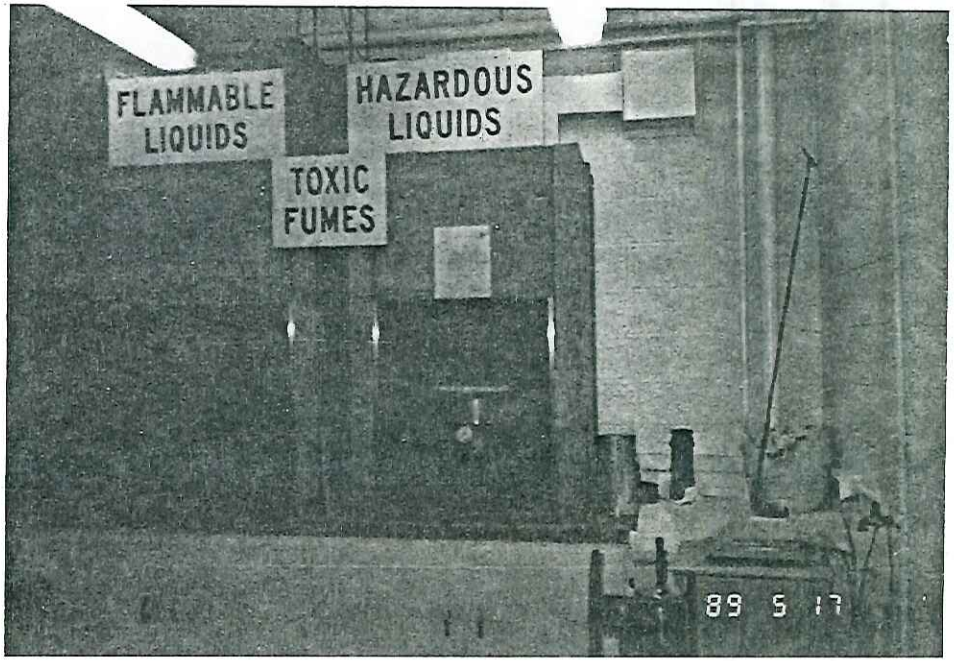
PHASE VI - RIGBY ADMINISTRATION BUILDING NO. 6092
Photographs (Clockwise from right)

25 Crawlspace - Construction Debris and ACM Ground Contamination (RA010)

26 Laboratory - Vacuum Hoods (Transite)

27 Hallway, New Addition - 12" Floor Tile and Mastic (RA007)





DPW PROJECT # 1999-9773

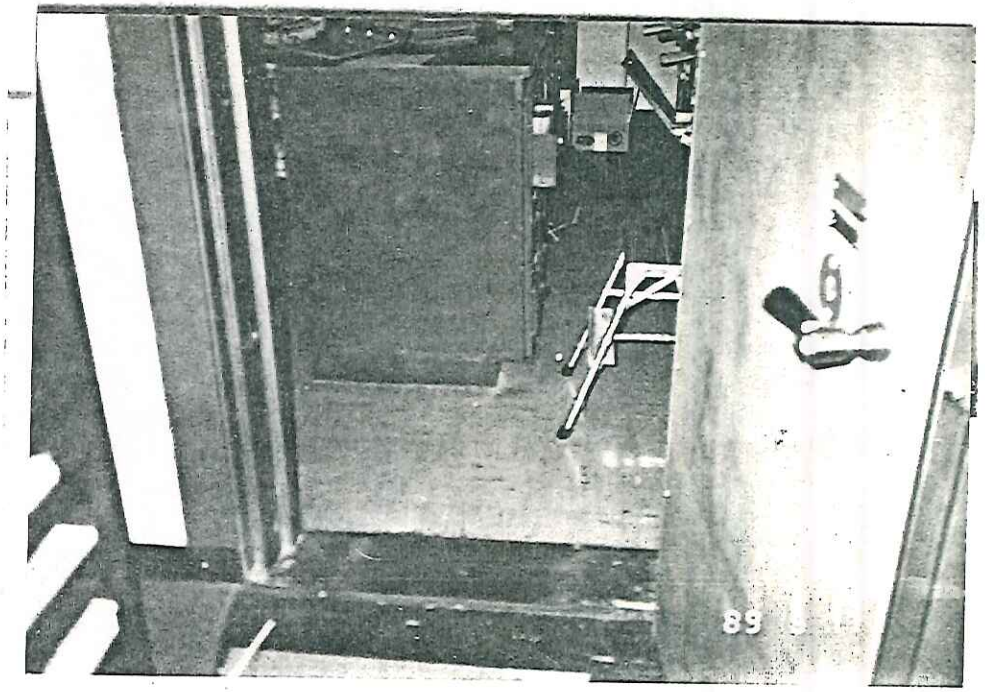
PHASE VI - RIGBY ADMINISTRATION BUILDING NO. 6092
Photographs (Clockwise from right)

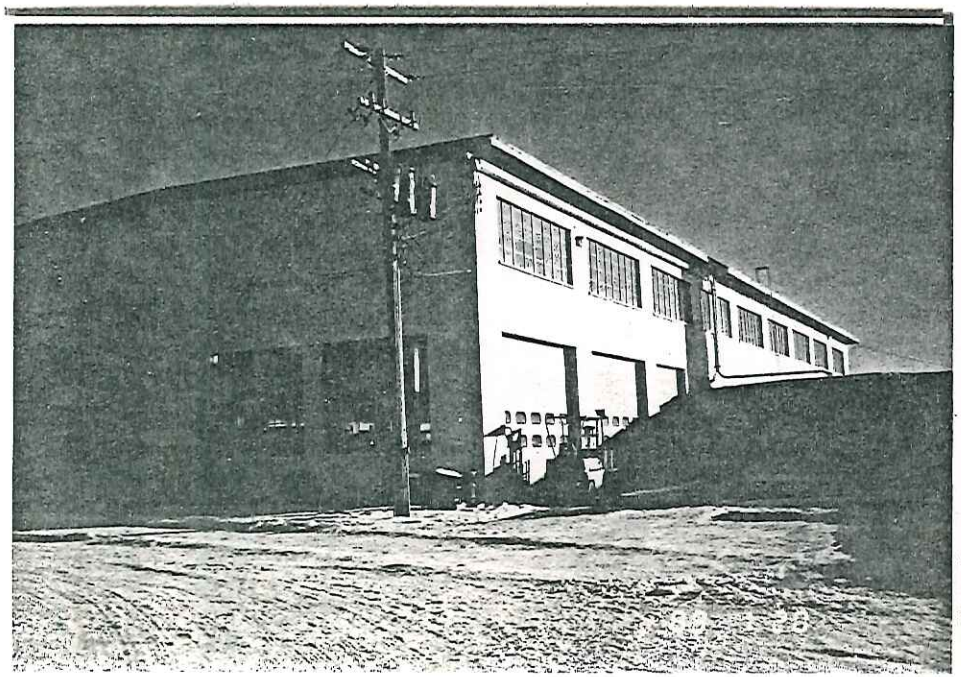
28 Vault, Original Building - 9" Floor Tile and Mastic

29 Plaster Fittings - Typical of Thermal System Insulation (RA009)

PHASE VII - RIGBY SERVICE MAINT. SHOP BLDG. NO.6093

30 Southwest corner of building





CHAIN-OF-CUSTODY DOCUMENTS

...CE

Project Name: Pocatello Idaho transportation Dept

CHAIN OF CUSTODY RECORD

Project No.: 1 2 9 9 9 9 2 3
Form No.: E 0 C P A 0 1
P.O. No.: _____

Samplers: (Print Name)	AHERA Certification Number	Date of Certification	Signature
D.E. Nichols	515-40-8109	July 88	
Tim A Rice	518-66-7864	July 88	

Sample Number	Analyte	Signature of Person Performing Analysis	REMARKS
9 1 2 3 E A 0 0 1	Asbestos		Mudd Elbow
9 1 2 3 E A 0 0 2	Asbestos		Mudd Elbow
9 1 2 3 E A 0 0 3	Asbestos		Mudd Elbow
9 1 2 3 E A 0 0 4	Asbestos		Mudd Elbow
9 1 2 3 E A 0 0 5	Asbestos		Floor Tile
9 1 2 3 E A 0 0 6	Asbestos		Mastic
9 1 2 3 E A 0 0 7	Asbestos		Basket
9 1 2 3 E A 0 0 8	Asbestos		table top
9 1 2 3 E A 0 0 9	Asbestos		floor tile
9 1 2 3 E A 0 0 10	Asbestos		floor tile
9 1 2 3 E M 0 0 1	Asbestos		floor tile
9 1 2 3 E M 0 0 2	Asbestos		floor tile
9 1 2 3 E M 0 0 3	Asbestos		Elbow
9 1 2 3 E M 0 0 4	Asbestos		Ceiling
9 1 2 3 E D 0 0 5	Asbestos		Board in bath room
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		

1. Relinquished By:		Received By:		2. Relinquished By:		* Received By:	
Print Name D.E. Nichols	Date 5/22/89	Print Name S.H. Sayles	Date	Print Name	Date	Print Name	Date
SSN 519-40-8107	Time	SSN 547-96-3481	Time	SSN	Time	SSN	Time
Sign D.E. Nichols	4:22	Sign		Sign		Sign	

Please Check Mudd Floor Tile Mastic

Project Name:
Rigby
Idaho Transportation Dept

CHAIN OF CUSTODY RECORD

Project No.: 1 9 9 9 7 2 3
Form No.: C O C A A 0 1
P.O. No.: _____

Samplers: (Print Name)	AHERA Certification Number	Date of Certification	Signature
D.E. Nichols	519-40-8109	July 84	D.E. Nichols
Tim A. Bird	518-66-7864	July 84	Tim A. Bird

Sample Number	Analyte	Signature of Person Performing Analysis	REMARKS
9 1 2 3 R A 0 0 1	Asbestos		Pipe Covering
9 1 2 3 R A 0 0 2	Asbestos		Boiler Covering
9 1 2 3 R A 0 0 3	Asbestos		Mudd Elbow
9 1 2 3 R A 0 0 4	Asbestos		Mudd Elbow
9 1 2 3 R A 0 0 5	Asbestos		Floor Tile
9 1 2 3 R A 0 0 6	Asbestos		Floor tile
9 1 2 3 R A 0 0 7	Asbestos		Floor tile
9 1 2 3 R A 0 0 8	Asbestos		Floor Tile
9 1 2 3 R A 0 0 9	Asbestos		Mudd Elbow
9 1 2 3 R A 0 1 0	Asbestos		Ground Contination Tunnel
9 1 2 3 R A 0 1 1	Asbestos		Mudd Elbow
9 1 2 3 R M 0 0 1	Asbestos		Mudd Elbow
9 1 2 3 R M 0 0 2	Asbestos		Elbow
9 1 2 3 R M 0 0 3	Asbestos		~~Elbow~~ Hanger
9 1 2 3 R M 0 0 4	Asbestos		~~Hanger~~ Floor Tile
9 1 2 3 R A 0 0 2	Asbestos		~~Floor Tile~~ Ceiling Tile
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		

1. Relinquished By:		Received By:		2. Relinquished By:		Received By:	
Print Name H.E. Nichols	Date 7/24/89	Print Name S.H. Saylor	Date	Print Name	Date	Print Name	Date
SSN 519-40-8109	Time 4:22	SSN 547-96-3581	Time	SSN	Time	SSN	Time
Sign H.E. Nichols		Sign		Sign		Sign	

Please Check all floor Tile samples

"KE

Project Name:
Idaho Dept. of Transportation
Rigby, Idaho
Administration Building

CHAIN OF CUSTODY RECORD

MKE Project No.: 1999-9773
Form No.: COCRA02
P.O. No.: DPW89-773

Samplers: (Print Name)	AHERA Certification Number	Date of Certification	Signature
Tim Bird Tim Bird	518-66-7864	July 1988	Tim A. Bird

Sample Number	Analyte	Signature of Person Performing Analysis	REMARKS
9773RA013	Asbestos		Plaster Fitting NW side of Mechnical Room
9773RA014	Asbestos		Boiler covering East side
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		

1. Relinquished By:		Received By:		2. Relinquished By:		Received By:	
Print Name: Tim Bird	Date: 6-7-89	Print Name: S H Saylor	Date: 6-8-89	Print Name:	Date:	Print Name:	Date:
SSN: 518 66 7864	Time:	SSN: 547-96-3481	Time: 11:45	SSN:	Time:	SSN:	Time:
Sign:		Sign:		Sign:		Sign:	

Hazfax bill: DPW project 89-773

Project Name: Shoshone Idaho Transportation Dept

CHAIN OF CUSTODY RECORD

Project No.: 1 9 9 7 5 7 0 7 3
Form No.: C O C S S O V
P.O. No.: _____

Samplers: (Print Name)	AHERA Certification Number	Date of Certification	Signature
H.E Nichols	519-40-8109	July 1988	H.E Nichols
Tim A Bird	518-66-7864	July 1988	Tim A. Bird

Sample Number	Analyte	Signature of Person Performing Analysis	REMARKS
9 2 2 3 5 S 0 0 1	Asbestos		Insulation
9 2 2 3 5 M 0 0 1	Asbestos		Ceiling Tile
9 2 2 3 5 M 0 0 2	Asbestos		Mudd Elbow
9 2 2 3 5 M 0 0 3	Asbestos		Floor Tile
9 2 2 3 5 M 0 0 4	Asbestos		Mudd Elbow
9 2 2 3 5 M 0 0 5	Asbestos		Mudd Manger
9 2 2 3 5 M 0 0 6	Asbestos		Mudd Elbow
9 2 2 3 5 M 0 0 7	Asbestos		Floor Tile
9 2 2 3 5 M 0 0 8	Asbestos		Mudd Elbow
9 2 2 3 5 M 0 0 9	Asbestos		Floor Tile
	Asbestos		Ceiling Tile
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		

1. Relinquished By:		Received By:		2. Relinquished By:		Received By:	
Print Name H.E Nichols	Date 5/24/89	Print Name S.H Sayles	Date	Print Name	Date	Print Name	Date
SSN 519-40-8109	Time	SSN 547-96-3481	Time	SSN	Time	SSN	Time
Sign H.E Nichols	4:22	Sign		Sign		Sign	

Please check all floor tile Mastic

KE 6435

Project Name:
ITD Shoshone, Rigby, Pocatello
HKE # 1999-9773
DPW# 89-773

CHAIN OF CUSTODY RECORD

Project No.: 1999-9773
Form No.: COCITD01
P.O. No.: P-4524

Samplers: (Print Name)	AHERA Certification Number	Date of Certification	Signature
H. E Nichols	519-40-8109	July 1988	H. E Nichols
Tim A. Bird	578-66-7864	July 1988	Tim A Bird

Sample Number	Analyte	Signature of Person Performing Analysis	REMARKS
971735S002	Asbestos		Spray-on insulation (white)
971735M004A	Asbestos		12" Floor Tile Brown & Black Mastic
971735M001A	Asbestos		9" Floor Tile green & Black Mastic
971735A010A	Asbestos		9" Floor Tile white & Black Mastic
971735A005A	Asbestos		9" Floor Tile TAN & Black Mastic
971735A011A	Asbestos		Plaster elbow insulation
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		
	Asbestos		

1. Relinquished By:		Received By:		2. Relinquished By:		Received By:	
Print Name	Date	Print Name Trish Peterson	Date	Print Name	Date	Print Name	Date
SSN	Time	SSN	Time	SSN	Time	SSN	Time
Sign		Sign		Sign		Sign	

Bill: Idaho STATE
Division of Public Work
502 N. 4th Street
Boise, Id 83720
P.O. P-4524

Analytica

MK

04400

Project Name:
Idaho Dept. of Transportation
Rigby, Idaho
Administration Building

CHAIN OF CUSTODY RECORD

MKE Project No.: 1999-9773
Form No.: COC-RA03
P.O. No.: DPW

Samplers: (Print Name)	AHERA Certification Number	Date of Certification	Signature
Tim Bird	518-66-7864	July 1989	Tim A Bird

Sample Number	Analyte	Signature of Person Performing Analysis
9773RA013A	Asbestos	
9773RA014A	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	
	Asbestos	

REMARKS

Split sample Plaster filling
" " Boiler Covering

Analytica

Please bill DPW project 89-773

PO P-4554

1. Relinquished By:		Received By:		2. Relinquished By:		Received By:	
Print Name: Tim Bird	Date: 6-7-89	Print Name: Christine Richards	Date:	Print Name:	Date:	Print Name:	Date:
SSN: 518-66-7864	Time:	SSN:	Time:	SSN:	Time:	SSN:	Time:
Sign:		Sign:		Sign:		Sign:	

LABORATORY REPORTS AND QUALIFICATIONS

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008652-008657	**Submitted by:**	Nicoles
Job Location:	Pocatello Transportation Dept.	**Page:**	1

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773PA001 PL008652 Thermal System Insulation,Plaster Elbow Boiler Room N.W. Side	None Detected	60% Binders 30% Mineral Wool 5% Cellulose 5% Diatoms	Friable Fibrous Grey	H
9773PA002 PL008653 Domestic Water Plaster Elbow N.W. Corner Under Stairs	None Detected	59% Binders 30% Mineral Wool 5% Cellulose 5% Diatoms 1% Wood Fibers	Friable Fibrous Grey	H
9773PA003 PL008654 Thermal System Insulation, Plaster Elbow Near Tunnel West Entrance	5% Chrysotile	63% Binders 30% Mineral Wool 1% Diatoms 1% Wood Fibers	Friable Fibrous Grey	H
9773PA004 PL008655 Thermal System Insulation, Plaster Elbow N. West Tunnel	None Detected	59% Binders 40% Mineral Wool 1% Diatoms	Friable Fibrous Whitish Grey	H
9773PA005 PL008656 9" Floor Tile Entrance to Boiler Room, Typical of Tile under Carpet.	None Detected	99% Binders 1% Wood Fibers	Nonfriable Fibrous Beige	H
9773PA006 PL008657 Mastic Boiler Room Entrance, Typical Mastic Used.	1-2% Chrysotile	98-99% Binders <1% Wood Fibers	Friable Fibrous Black	H

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

DRD

Deb Dorband , Senior Analyst

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

Robert Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008658-008661B	**Submitted by:**	Nicoles
Job Location:	Pocatello Transportation Dept.	**Page:**	2

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773PA007 PL008658 Oven Door Gasket, Lab	50-60% Chrysotile	40-50% Wood Fibers	Friable Fibrous White	H
9773PA008 PL008659A Table Top, Lab.	None Detected	80% Binders 20% Wood Fibers	Friable Fibrous Black	L
9773PA008 PL008659B Table Top Backing, Lab.	None Detected	90% Wood Fibers 10% Binders	Friable Fibrous Brown	L
9773PA009 PL008660A 12" Floor Tile, Assembly Room	None Detected	98% Binders 2% Wood Fibers <1% Fiberglass	Nonfriable Fibrous White	L
9773PA009 PL008660B Adhesive, Assembly Room	None Detected	98% Binders 2% Wood Fibers	Nonfriable Fibrous Brown	L
9773PA010 PL008661A 9" Floor Tile, Janitors Closet	None Detected	98% Binders 2% Wood Fibers	Nonfriable Fibrous Beige	L
9773PA010 PL008661B Mastic, Janitors Closet	3-5% Chrysotile	94-96% Binders 1% Wood Fibers	Friable Fibrous Black	L

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

DRD

Deb Dorband , Senior Analyst

Robert A Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008662-008666	**Submitted by:**	Nicoles
Job Location:	Pocatello Transportation Dept.	**Page:**	3

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773PM001 PL008662A Floor Tile, Boiler Room	None Detected	98% Binders 2% Wood Fibers	Nonfriable Fibrous Tan	L
9773PM001 PL008662B Mastic, Boiler Room	None Detected	95% Binders 5% Wood Fibers	Friable Fibrous Black	L
9773PM002 PL008663A Floor Tile, Hallway	<1% Chrysotile	99% Binders 1% Wood Fibers	Nonfriable Fibrous Green	L
9773PM002 PL008663B Mastic, Hallway	None Detected	80% Binders 20% Wood Fibers	Friable Fibrous Black	L
9773PM003 PL008664 Elbow, Closet, Hallway	None Detected	50% Binders 50% Mineral Wool	Friable Fibrous Grey	H
973PM004 PL008665 Blown On Ceiling	2-4% Chrysotile	84-86% Binders 10% Perlite 2% Wood Fibers	Friable Fibrous Grey	H
9773PM005 PL008666 Board, Lath Room	70-80% Chrysotile	15-25% BInders 5% Wood Fibers	Friable Fibrous White	H

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

DRO

Deb Dorband , Senior Analyst

Robert Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008683-008688A	**Submitted by:**	Nicoles
Job Location:	Rigby Transportation Department	**Page:**	1

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773RA001 PL008683 Piping, Boiler Room	None Detected	50% Wood Fibers 30% Binders 20% Fiberglass	Friable Fibrous Grey,Yellow,Black	H
9773RA002 PL00868684 Elbow, Boiler Room	None Detected	60% Binders 30% Wood Fibers 10% Mineral Wool	Friable Fibrous White	H
9773RA003 PL008685 Elbow,Fiberglass Runs	None Detected	60% Mineral Wool 40% Binders	Friable Fibrous Grey	H
9773RA004 PL008686 Mudd, Boiler Room	None Detected	60% Binders 30% Mineral Wool 10% Fiberglass	Friable Fibrous Grey,Yellow	H
9773RA005 PL008687A Floor Tile, Under Carpet	<1% Chrysotile	98% Binders 2% Wood Fibers	Nonfriable Fibrous Tan	L
9773RA005 PL008687B Mastic, Under Carpet	None Detected	98% Binders 2% Wood Fibers	Friable Fibrous Black	L
9773RA006 PL008688A Floor Tile, Break Room	None Detected	99% Binders 1% Wood Fibers	Nonfriable Fibrous White	L

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

DRD

Deb Dorband , Senior Analyst

Robert Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008688B-008692	**Submitted by:**	Nicoles
Job Location:	Rigby Transportation Department	**Page:**	2

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773RA006 PL008688B Mastic, Break Room	3-5% Chrysotile	93-95% Binders 2% Wood Fibers	Friable Fibrous Black	L
9773RA007 PL008689A Floor Tile, Conference Room - New Addition	None Detected	99-100% Binders <1% Wood Fibers	Nonfriable Fibrous White	L
9773RA007 PL008689B Mastic, Conference Room - New Addition	3-5% Chrysotile	92-94% Binders 3% Wood Fibers	Friable Fibrous Black	L
9773RA008 PL008690A Floor Tile, Drafting Room - New Addition	<1% Chrysotile	95% Binders 5% Wood Fibers	Nonfriable Fibrous White	L
9773RA008 PL008690B Mastic, Drafting Room - New Addition	5% Chrysotile	94% Binders 1% Wood Fibers	Friable Fibrous Black	L
9773RA009 PL008691 Elbow, Crawl Space	5% Chrysotile <1% Amosite	50% Mineral Wool 39% Binders 5% Wood Fibers 1% Diatoms	Friable Fibrous Grey	H
9773RA010 PL008692 Ground Contamination, Crawl Space	5% Chrysotile 1% Amosite	52% Binders 40% Mineral Wool 1% Diatoms 1% Wood Fibers	Friable Fibrous Grey	H

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

DRD

Deb Dorband , Senior Analyst

Robert Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008693-008697	**Submitted by:**	Nicoles
Job Location:	Rigby Transportation Department	**Page:**	3

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773RA011 PL008693 Elbow, Store Room Basement - New Addition	None Detected	50% Binders 40% Mineral Wool 5% Diatoms 5% Wood Fibers	Friable Fibrous Grey	H
9773RA012 PL008694 Ceiling Tile, New Addition	None Detected	70% Wood Fibers 10% Binders 10% Mineral Wool 10% Perlite	Friable Fibrous Grey	H
9773RM001 PL008695 12" Elbow, Shop Area	None Detected	40% Mineral Wool 38% Binders 10% Cellulose 10% Fiberglass 1% Diatoms 1% Wood Fibers	Friable Fibrous Grey,Yellow	H
9773RM002 PL008696 Elbow, Closet, Hallway	None Detected	44% Binders 40% Mineral Wool 10% Cellulose 5% Wood Fibers 1% Diatoms	Friable Fibrous Grey	H
9773RM003 PL008697 Hanger, Closet, Hallway	None Detected	50% Mineral Wool 43% Binders 5% Cellulose 1% Diatoms 1% Wood Fibers	Friable Fibrous Grey	H

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

DRD

Deb Dorband , Senior Analyst

Robert A. Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008698A-008698B	**Submitted by:**	Nicoles
Job Location:	Rigby Transportation Department	**Page:**	4

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773RM004 PL008698A Floor Tile, Hallway	None Detected	99% Binders 1% Wood Fibers	Nonfriable Fibrous Brown	L
9773RM004 PL008698B Adhesive, Hallway	None Detected	95% Binders 5% Wood Fibers	Friable Fibrous Dark Brown	L

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

DRD

Deb Dorband , Senior Analyst

Robert A. Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	Jun 08 89
Address:	502 N. 4th St.	**Date Analyzed:**	Jun 09 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	Jun 09 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	009071-009072	**Submitted by:**	Gloria McGillivary
Job Location:	Rigby Transportation Department DPW-89-773	**Page:**	1

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773RA013 PL009071 Plaster Fitting, N.W. Side of Mechanical Rm.	None Detected	50% Mineral Wool 20% Cellulose 15% Binders 10% Wood Fibers 5% Diatoms	Friable Fibrous White	H
9773RA014 Boiler Covering, East Side	None Detected	50% Mineral Wool 39% Binders 5% Diatoms 5% Fiberglass 1% Wood Fibers	Friable Fibrous White	H

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

DRD

Deb Dorband , Senior Analyst

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

Robert A. Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008667-008671	**Submitted by:**	Nichols
Job Location:	Shoshone Transportation Department	**Page:**	1

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773SS001 PL008667 Spray Insulation, Paint Storage	None Detected	99% Cellulose 1% Binders	Friable Fibrous Whitish/Grey	H
9773SM001 PL008668 12" Ceiling Tile, Break Room N.E. Corner	None Detected	90% Wood Fibers 10% Binders	Friable Fibrous Brown/Grey	H
9773SM002 PL008669 Plaster Elbow, Break Room N.E. Corner	5% Chrysotile	44% Binders 20% Cellulose 20% Mineral Wool 10% Wood Fibers 1% Diatoms	Friable Fibrous Grey	H
9773SM003 PL008670A 12" Floor Tile, Break Room N.E. Corner	1-3% Chrysotile	96-98% Binders 1% Wood Fibers	Nonfriable Fibrous Brown	L
9773SM003 PL008670B Mastic, Break Room N.E. Corner	5% Chrysotile	94% Binders 1% Wood Fibers	Friable Fibrous Black	L
9773SM004 PL008671A 12" Floor Tile, Lock, Break Room, Hall, Janitors Closet	None Detected	99% Binders 1% Wood Fibers	Nonfriable Fibrous Red	L
9773SM004 PL008671B Mastic, Lock, Break Room, Hall, Janitors Closet	1-3% Chrysotile	96-98% Binders 1% Wood Fibers	Friable Fibrous Black	L

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

DRD

Deb Dorband , Senior Analyst

Robert A. Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

HAZTOX, INC.

Bulk Material Analysis Data Summary

Client:	State of Idaho Division of Public Works	**Date Received:**	May 22 89
Address:	502 N. 4th St.	**Date Analyzed:**	May 24 89
City,State,Zip:	Boise, ID. 83720	**Date Reported:**	May 24 89
Telephone:	(208) 344-3453	**Client # :**	B00038
Sample Code #:	008672-008676	**Submitted by:**	Nichols
Job Location:	Shoshone Transportation Department	**Page:**	2

Sample Description (Sample ID No.)	Percent & Type of Asbestos Present	Percent & Type of Other Materials	Sample Appearance	Layer* (H-L)
9773SM005 PL008672 8" Plaster Elbow Tool Storage, Electrical Repair Shop	10% Chrysotile	44% Binders 40% Mineral Wool 5% Wood Fibers 1% Diatoms	Friable Fibrous Grey	H
9773SM006 PL008673 8" Hanger Tool Storage, Electrical Repair Shop	5% Chrysotile	50% Mineral Wool 43% Binders 1% Diatoms 1% Wood Fibers	Friable Fibrous Grey	H
9773SM007 PL008674 3" Plaster Elbow Parts Shop, Office, Restroom	10% Chrysotile	44% Binders 40% Mineral Wool 5% Wood Fibers 1% Diatoms	Friable Fibrous Grey	H
9773SM008 PL008675A 12" Floor Tile Parts Shop, Office, Restroom	None Detected	99% Binders 1% Wood Fibers	Nonfriable Fibrous Tan	L
9773SM008 PL008675B Mastic Parts Shop, Office, Restroom	None Detected	95% Binders 5% Wood Fibers	Friable Fibrous Black	L
9773SM009 PL008676 2'x 4' Ceiling Tile Parts Shop, Office, Sec. Corner	None Detected	90% Wood Fibers 10% Binders	Friable Fibrous Grey	H

* L in "Layer Column" above, indicates a layered sample, H indicates a homogeneous sample.

Was Sample Homogenized? No

Method of Analysis: Polarized Light Microscopy, using EPA 1982 Interim Method

Microscope: Olympus BH2 Polarizing Light Microscope

I certify that these results are accurate for the samples tested, and that the analyses comply with accepted methods of analysis. These results relate only to the samples tested.

DD

Deb Dorband , Senior Analyst

Robert A. Woellner

Robert A. Woellner, Lab. Director

HAZ.TOX INC., 820 N. Linder, Meridian, Idaho 83642 (208)888-7121

ANALYTICA
—I—N—C—O—R—P—O—R—A—T—E—D—

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY
POLARIZED LIGHT MICROSCOPY (PLM)

CLIENT: State of Idaho LGN: 64237

PROJECT IDENTIFICATION: MKE#1999-9773, ITD Shoshone, Rigby & Pocatello, DPW #89-773/PO#P4524 PAGE 1 of 2

Sample Description:

Sample Number	Sample Date	Description/Condition/Location
9773SS002		White spray-on insulation/paint storage ITP
9773SM004A		12" brown floor tile and black mastic/locker-band room-hall janitors closet
9773PM001A		9" green floor tile and black mastic/janitors closet
9773PA010A		9" white floor tile and black mastic/janitors closet
9773RA005A		9" tan floor tile and black mastic/under carpet

Results of PLM Analysis: Estimated Volume Percents

Sample Number	9773SS002	9773SM004A	9773PM001A	9773PA010A	9773RA005A
Asbestiform Minerals					
Amosite					
Anthophyllite					
Chrysotile		25	20	tr	12
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	**0**	**25****	**20****	**tr****	**12*****
Other Fibrous Material					
Fibrous Glass					
Cellulose	90				
Synthetics					
Other					5 Wollastonite
Nonfibrous Materials	10	75	80	100	83

**Mastic contains trace chrysotile

**Mastic contains trace chrysotile

***Mastic contains 25% chrysotile

****Mastic contains 1% chrysotile

* tr = <1%

Analyst: Dennis D. Finn Date: May 30, 1989

Dennis D. Finn

ANALYTICA
—I—N—C—O—R—P—O—R—A—T—E—D—

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY
POLARIZED LIGHT MICROSCOPY (PLM)

CLIENT: State of Idaho LGN: 64237

PROJECT IDENTIFICATION: MKE#1999-9773, ITD Shoshone, Rigby & Pocatello, DPW #89-773/PO#P4524 PAGE 2 of 2

Sample Description:

Sample Number	Sample Date	Description/Condition/Location
9773RA011A		Plaster elbow insulation/store room basement northwest end

Results of PLM Analysis: Estimated Volume Percents

Sample Number 9773RA011A

Asbestiform Minerals	
Amosite	
Anthophyllite	
Chrysotile	
Crocidolite	
Tremolite-Actinolite	
TOTAL ASBESTOS	**0**
Other Fibrous Material	
Fibrous Glass	35
Cellulose	2
Synthetics	
Other	
Nonfibrous Materials	63

* tr = <1%

Analyst: Dennis D. Finn Date: May 30, 1989

Dennis D. Finn

ANALYTICA
—I—N—C—O—R—P—O—R—A—T—E—D—

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY
POLARIZED LIGHT MICROSCOPY (PLM)

CLIENT: State of Idaho LGN: 64406

PROJECT IDENTIFICATION: Rigby, Idaho Project#89-773 PO#P-4484
MKE#1999-9773 PAGE 1 of 1

Sample Description:

Sample Number	Sample Date	Description/Condition/Location
9773RAO13A	6/5/89	Plaster filling/split
9773RAO14A	6/5/89	Boiler covering/split

Results of PLM Analysis: Estimated Volume Percents

Sample Number	9773RAO13A	9773RAO14A
Asbestiform Minerals		
Amosite		
Anthophyllite		
Chrysotile		
Crocidolite		
Tremolite-Actinolite		
TOTAL ASBESTOS	**0**	**0**
Other Fibrous Material		
Fibrous Glass	40	35
Cellulose		
Synthetics		
Other		
Nonfibrous Materials	60	65

* tr = <1%

Analyst: Mark Cooperrider Date: June 12, 1989

Mark Cooperrider

HAZTOX, Inc.

BULK ASBESTOS ANALYTICAL PROTOCOL MANUAL

by

Wayne R. Dorband, PhD.

LABORATORY FACILITIES AND EQUIPMENT (2-89) III.1

HAZTOX, Inc.'s laboratory is located at 820 North Linder Road, Meridian, Idaho, 83642. The laboratory telephone numbers are (208)888-7121 and 1-(800)548-8220. HAZTOX, Inc. operates its laboratory from 8:00 a.m. to 6:00 p.m. daily, and provides an on-call 24 hour emergency service for all clients. The HAZTOX, Inc's. laboratory is part of a modern, custom designed 3200 square foot, one-story building in a suburb of Boise, Idaho. The laboratory occupies approximately 2000 square feet of the building and is divided into a main microscopy area, two preparation rooms, a TEM complex, and several other laboratory areas. The PLM preparation and analysis areas are kept under negative pressure at all times and are separated from other analytical areas. A diagram of the laboratory is provided on Page 3A. The laboratory has a separate climate control system, and has exhaust vents which can be separately operated throughout the area.

The following equipment is utilized by HAZTOX, Inc. to conduct bulk asbestos analysis:

- Olympus BHTP polarized light microscope with 10x, 20x, 40x, and 10x dispersion staining objectives; Bertrand Lense; 360 degrees rotatable stage; and, other applicable accessories.
- Olympus BHT combination polarized light microscope with 10x, 20x, and 40x objectives; 360 degrees rotatable stage; and, other applicable accessories.
- Low power Olympus stereoscopic microscope with Olympus TGHM light source.
- Airfiltronix Class I fume hood with HEPA filter.
- Purifier Class II Safety Hood-Labconco.

A manual is kept in the laboratory which provides the following information for each of the equipment items utilized in bulk asbestos testing:

- Name of the equipment item
- Manufacturer's name
- Type, identification, and serial number
- Date received and date placed in service
- Current location
- Maintenance schedule and activities
- Date of last calibration; next calibration date; and calibration report references

The following supplies (expendable and nonexpendable) are utilized in bulk asbestos testing:

- Sampling utensils, including razor knives, forceps, probes, and needles
- Microscope slides and cover slips
- Refractive index fluids
- Mortar and pestle
- Immersion oil

These supplies are kept in labeled drawers or cabinets in the laboratory. The Laboratory Director is responsible for ordering supplies when they are needed. Supply and equipment operational guidelines are kept in a labeled file in the laboratory.

STAFF TRAINING (2-89) IV.1

To date, HAZTOX, Inc. has conducted most of its bulk asbestos analysis training in-house. Dr. Dorband and Ms. Dorband were initially self-taught in the EPA interim technique. This self-training was necessary since it occurred over eight years ago when bulk asbestos analysis was in its infancy and there were no outside training courses available. Both Dr. Dorband and Ms. Dorband had significant microscopy training and experience in other applications before initiating bulk asbestos testing.

Ms. Dorband has trained several other HAZTOX, Inc. analysts over the last eight years, and is currently training Mr. Robert Woellner and Mr. Steve Williams at our facility. Dr. Dorband has recently completed the University of Texas, Environmental Research Institute course entitled "Advanced Optical Mineralogy and Asbestos Identification using PLM" and has had eight years of experience as a professor at the University level. HAZTOX, Inc. operates a continuing education program which trains new PLM analysts beginning at the level of education, experience, and expertise of the new analyst. This ongoing program consists of the following elements:

- Interview and testing to determine entry level expertise.
- Introduction to microscopy, microscope use and maintenance, general asbestos overview and basic fiber counting (4-6 hrs).
- Apprenticeship work with a trained analyst (6 - 8 hrs). IV. Sample collection, pump handling and pump calibration (4-6 hrs).
- Sample handling upon receipt in laboratory, log-in procedures, and chain of custody procedures (2-4 hrs).
- Sample preparation as per EPA interim method (2 - 4 hrs).
- Sample analysis as per EPA interim method (4 - 6 hrs).
- Additional apprenticeship work with a trained analyst (12 - 16 hrs).
- Data reduction, quality control, quality assurance, reporting of sample results (4 - 6 hrs).
- Participation in analytical sequence with emphasis on monitoring by Laboratory Quality Assurance Officer (Dr. Wayne Dorband).
- Audits in intra-laboratory and inter-laboratory programs (ongoing).
- Semi-annual refresher course in analytical protocol.
- Successful participation in PLM training course at McCrone or suitable equivalent.

BULK MATERIAL SAMPLE PREPARATION FOR PLM MICROSCOPY (2-89) VI.1

Specific methodology for preparing bulk materials for PLM analysis varies greatly between different material types. Some samples can be pulled apart easily using tweezers, while others require pulverization using a mortar and pestal. The specific methodology used at HAZTOX, Inc., for any given sample type is documented in the "EPA 1982 Interim Method". Sample Preparation Analysts are trained in material type identification, and use professional judgment in choosing a preparation method.

There are several general steps taken for all sample preparations which do not change with sample type. These steps primarily involve safety and sample homogeneity issues. Each sample is carefully observed (using a low powered stereo microscope) to determine if identifiable layering is present. If there are multiple layers, the sample is subdivided into its various component layers, and a separate microscope slide is prepared for each layer.

All stages of the sample preparation, including opening of the sample container, are conducted within the Class I fume hood in the sample preparation area. In the hood, only one sample is prepared at a time, and a thorough wet clean-up is completed between sample preparations. Only new uncontaminated microscope slides are used, and are not introduced into the fume hood until the sample is ready to be put onto the slide. Slides are not used more than once, and are then discarded into a special sample disposal container, which is periodically double-bagged and taken with other asbestos waste to the Ada County landfill.

As a part of sample preparation, the Sample Preparation Analyst will visually classify the sample using a low magnification stereo microscope and record its friability, color, and general character. Multiple slides may be prepared for each sample, depending upon the specific sample characteristics. This information is noted on the analysis form and will be verified by the PLM analyst.

Prior to initiating sample preparation, the HAZTOX, Inc. Sample Preparation Analyst signs the chain of custody form for each sample, indicating receipt of the sample. When sample preparation is complete, the Sample Preparation Analyst moves the prepared microscope slide and the analysis form to the microscopy holding area. At that time, the sample evidence form is signed and released by the Sample Preparation Analyst.

BULK ASBESTOS PLM ANALYSIS (2-89) VII.1

Each HAZTOX, Inc. PLM asbestos analysis is conducted using the Environmental Protection Agency, "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA 600/M4-82-020, December 1982. The specific protocol for this method is described in detail on the following pages of the actual federal documentation (See Pages 7A through 7E). PLM Analysts will routinely refer to this document any time there are questions regarding methodology. HAZTOX, Inc. does not deviate from the Interim Method in any way for the PLM analysis procedure.

Each prepared sample (microscope slide) is obtained from the sample preparation area by the PLM analyst, along with analysis form, and the sample bag containing the original sample. The analyst signs the chain-of-custody evidence record as the sample is received. When microscopic analysis is completed, the analyst signs release of the sample and submits the sample analysis form to the clerical staff for completion of the report. Following completion of analysis, the PLM analyst moves the sample container into a bulk storage holding area.

Quality assurance procedures are utilized during sample preparation and analysis. These specific procedures are described in detail in the Quality Control section of this manual.

BULK ASBESTOS ANALYSIS SAMPLE RESULTS REPORTING (2-89) X.1

Following completion of PLM sample analysis, the HAZTOX, Inc. analyst signs and dates the completion time for the analysis in the Sample Log-in Book. Also, a brief summary of analysis results are generally recorded in the log-in book.

During analysis, the PLM analyst carefully fills in all of the applicable count information on the laboratory report form and completes calculations for the percentages of material types present in the sample. When completed, this laboratory analysis form is submitted to the clerical staff member who places the laboratory report form into the appropriate (opened) client file.

When all analyses for an appropriate project (file) are completed, the HAZTOX, Inc. clerical staff prepares a report which will be transmitted to the client. An example of this report form is provided in Appendix B. Information which is included on the sample report form includes:

- client name and address
- client number
- date of sample check-in
- date of sample analysis
- client's description of samples
- sample color
- % of asbestos by type in the sample
- % of other fibrous and non-fibrous materials present
- sample friability
- sample homogeneity and the presence or absences of layers
- signature of analyst
- any additional comments about samples

Multiple samples are often reported on one sample report form if applicable. Quality assurance program results are not typically reported to the client, but will be if requested.

CALIBRATION (2-89) XI.1

All instrument maintenance activities for each instrument are carefully kept in a log manual. This manual contains descriptions of the equipment previously mentioned in the section entitled "Facilities and Equipment". Also, the manual details any maintenance and calibration activities conducted on the instrument, and describes which individual conducted the maintenance actions. Preventative maintenance is always preferred over diagnostic repairs with laboratory instruments.

For each Polarized Light Microscope, a required calibration procedure, which is described below, is conducted and checked at least once per day. This calibration procedure includes assuring that:

- the substage polarizer and the analyzer are oriented at 90 degrees to one another. The orientation of the polarizer is to be E-W and the accessory slot is 45 degrees to the privileged directions of the polarizer and the analyzer;
- the ocular crosshairs coincide with the privileged directions of the polarizer and the analyzer;
- the stage is centered to prevent fibers from leaving the field of view during stage rotation;
- the objective lenses are centered to prevent structures from leaving the field of view during stage rotation; and
- the substage condenser and iris diaphram are centered in the optic axis.

During each calibration, the analyst performing the calibration fills out a microscope calibration form for the microscope, and inserts it into the equipment manual.

Periodically, the refractive index oils are calibrated with an accuracy of 0.004. This procedure is conducted within a temperature tolerance range of 2 degrees Centigrade. Laboratory temperature is recorded daily. All refractive index oil calibration is documented on a calibration form which is kept in the equipment manual.

BULK ASBESTOS TESTING QUALITY ASSURANCE PROGRAM (2-89) XII.1

Quality assurance is of ultimate concern in HAZTOX, Inc.'s asbestos testing program. Every aspect of the program previously discussed has quality assurance protocol which is applicable. Sections of this quality assurance program also apply to other laboratory analysis areas conducted at HAZTOX, Inc. Separate topics involving Quality Assurance Program actions are described in detail in the following subsections. Dr. Wayne Dorband serves as the Quality Assurance Officer (QAO) for the HAZTOX, Inc. laboratory.

Contamination Testing XII.2

Potential contamination of samples, equipment and supplies is a factor which is carefully considered in HAZTOX, Inc's. analytical testing program. Therefore, analysts periodically conduct contamination checks to reduce the chance of erroneous sample results and the possibility of analyst asbestos exposure.

At a frequency of every 20 samples, the Sample Preparation Analyst inserts a known asbestos standard into the analysis process. If analysis of this sample reveals any contamination, the sample is recounted by a second analyst to verify the analysis. If this verification is positive, then the Quality Assurance Officer is notified and the preparation and analytic procedures are carefully scrutinized. Also, all equipment and supplies are diligently cleaned.

Daily, an empty slide is prepared and analyzed to detect potential contamination of oils, slides, and coverslips. Once a week the Sample Preparation Analyst prepares at least one slide from debris collected from a tape sample from microscopes, hood surfaces, sample preparation tools, and laboratory countertops. If the PLM analyst identifies any asbestos fibers in this contamination test, the Quality Assurance Officer is again notified. The QAO holds a meeting with all laboratory personnel and develops a plan to improve sample handling techniques. Also, the entire laboratory area and all equipment and supplies are carefully cleaned. Following cleaning, another tape test sample is analyzed and if still contaminated, the entire process is repeated until no contamination is noted.

Laboratory Reference Materials XII.3

HAZTOX, Inc. maintains a reference library of documents and standards which are applicable to all types of analytical procedures. For bulk asbestos testing, a complete set of reference slides prepared by McCrone, Inc., representing fiber and particle types encountered by analysts is kept and continually updated. Also, permanent slides of unusual fiber types are periodically prepared for future reference by analysts. HAZTOX, Inc. is continually updating its reference document library. At a minimum, analysts have full time access to the following documents which are kept in the laboratory:

- McCrone Asbestos Particle Atlas
- 40 CFR Part 763, Vol. 52, No. 210 "Asbestos-Containing Materials in Schools; Final Rule and Notice"
- Draft ASTM method for Polarized Light Microscope Analysis of Asbestos Containing Material

Analytical Quality Assurance Objectives XII.4

The analysis of bulk building materials for asbestos can be divided into three related areas: identification, classification, and quantification. Identification is the qualitative determination of sample component materials. Classification is the placement of a sample results into one of two categories: % and 1% asbestos. Classification has both qualitative and quantitative aspects. Asbestos in a sample must be first identified if it is to be quantified. The amount of asbestos present in a sample must be accurately quantified, with respect to the 1% level, to be classified correctly according to EPA definitions.

Precision (2-89) XII.5

Precision is the measure of the analysts ability to correctly classify the percent of asbestos, in a duplicate analysis, into one of the following categories:

Negative	0% asbestos
Trace	>0% to 1% asbestos
Low Positive	>1% to 10% asbestos
Middle Positive	>10% to 30% asbestos
High Positive	>30% asbestos

Quality control activities which determine analyst precision consist of the following:

- A minimum of three split samples per analyst per day. Samples are split by the Sample Preparation Analyst and are unknown to the PLM analyst. Daily, results of split samples are compiled on a QC form. An example of this form is provided in Appendix B.
- Each day, the Sample Preparation Analyst will randomly select a minimum of three samples from the previous day for reanalysis. These samples will be reanalyzed without the knowledge of the original analysis results. After these "reanalysis" samples are analyzed, the results are compiled in the QC notebook.
- Daily, 5% of the samples analyzed will be reanalyzed by a second PLM analyst. These samples are chosen by the Sample Preparation Analyst and are noted on the laboratory analysis form. Following reanalysis, the results are compiled in the QC notebook.

To satisfy QC objectives, all duplicate analyses and routine reanalyses must agree with respect to the following:

- the types and amount of asbestos present, within the category ranges described earlier in this section;
- the types of other fibrous materials present in amounts greater than 5% (a fibrous particle has an aspect ratio of length to width of greater than 3:1); and
- presence of vermiculite, perlite, diatoms, mica, quartz, or pumice in amounts greater than 5%.

Routinely, analytical reports are reviewed by a senior analyst (Ms. Deb Dorband or Dr. Wayne Dorband) and additional samples may be selected for reanalysis. Samples which are commonly selected may include, but are not limited to, the following sample types:

- samples that contain vermiculite and perlite, but no asbestos, because these materials are, in practice, often associated with low percentages of asbestos;
- samples that contain tremolite, anthophyllite, actinolite, wollastonite, talc, or brucite (the first three are rather unusual forms of asbestos, while the latter three materials are often confused with asbestos); or
- any sample that, for any reason, is questioned by the analysts or QA Officer.

Accuracy And Representativeness (2-89) XII.6

Accuracy is a measurement of the ability of an analyst to correctly identify asbestos or other types of materials. Whereas representativeness indicates if the material analyzed is truly representative of the actual sample components. Both of these quality assurance parameters are evaluated by analyzing known standard samples, participating in EPA and NIST reference testing programs, and participating in interlaboratory round-robin testing programs. Daily, the Sample Preparation Analysts will insert a minimum of 2%, or one sample per day of known reference materials into the routine analytical process. These samples are prepared from standards in the same manner as all regular samples. After PLM analysis, the results of these analyses are complied on the QC form and evaluated by the QAO. Daily, a minimum of 2%, or one sample, are split by the Sample Preparation Analysts and the splits are sent to another laboratory successfully participating in the EPA interim bulk program (NHS, Inc., Richland, WA). After the split results are returned from the other round-robin laboratory, they are compiled with the original sample results on the QC form. Quarterly, the proficiency samples from EPA or NIST are analyzed independently by each PLM analyst at HAZTOX, Inc. These results are submitted as requested, and when reports from EPA or NIST are returned, they are evaluated by the QAO.

Quality Control Program Evaluation (2-89) XII.7

Results from all Quality Control analyses are summarized on a weekly basis by the QAO. Summarized information includes data on:

- blanks
- daily intralaboratory splits
- daily reanalyses (minimum of 5%)
- known reference sample analyses
- interlaboratory round-robin analyses
- NBS or EPA proficiency analyses

This summary is evaluated to determine the competency of analysts as well as to determine if deficiencies are present which should be corrected.

Corrective Action (2-89) XII.8

The appropriate corrective action for each incident will be prescribed on an individual basis. Any time an error in analysis is detected through the QC/QA activities, the QAO will conduct an inquiry as to the possible causes and implications of the error. Recommended corrective action may involve something as minor as checking another 5% of an analyst's samples, or it may involve complete reanalysis of every sample analyzed by a second analyst. Corrective action could involve a refresher training course for the analyst given by the laboratory director, or in a serious case, dismissal of the analyst from future bulk asbestos analyses.

ANALYTICA
—I—N—C—O—R—P—O—R—A—T—E—D—

PLM
BULK SAMPLE ANALYSIS PROCEDURES

Bulk samples of construction materials are analyzed by professional mineralogists according to the guidelines set by the Environmental Protection agency (EPA-600/M4-82-020, December 1982). Additional tests and treatments (see below) may also be required for certain samples.

Analytica Incorporated is AIHA accredited (Certificate #307) and accredited by the National Institute for Standards and Technology under the National Voluntary Laboratory Accreditation Program (NVLAP). Analytica participates in the EPA Interim Bulk Sample Analysis Quality Assurance Program and maintains an in-house QC/QA program for bulk samples whereby at least 10% of all submitted samples are re-analyzed and documented in a Quality Control Manual. Analytica also participates in 3 quarterly Round Robin QC/QA programs with several accredited laboratories throughout the United States. Current and past QC/QA program results are available in the laboratory for inspection.

Unused portions of samples are archived for one year unless client requests special handling.

ASHING

Ashing is a procedure in which one half of the sample is placed in a crucible and then set in a furnace at 500°C for one hour. Most non-silicate interferants burn; asbestos remains unaltered. The amount of the ashed material is compared to the original amount, to determine the volume percent lost due to ashing. The ashed sample is analyzed by PLM for the kind and percentage of asbestos present.

Unless otherwise noted, the results shown on the final report are the percentage of asbestos in the original material, not the ashed material. For example, if 50% of the original material is lost due to combustion and the ashed sample contains 10% asbestos, the final report would show 5% asbestos in the original material.

EXTRACTION

Extraction is a procedure used for tar samples such as roofing tar which are too dark to see through in polarized light. One half of the sample is placed in a plastic jar with an organic solvent and stirred for one half hour. The residue is then washed with alcohol, stirred for 5 minutes, filtered and dried. The filtered material is analyzed for asbestos, with the results on the final report the percentage in the original material (as above for ashing).

INSPECTOR QUALIFICATIONS

Rocky Mountain Center for
Occupational and Environmental Health
University of Utah

HARRY NICHOLS

HAS COMPLETED A COURSE AND PASSED AN EXAMINATION IN

PRACTICES AND PROCEDURES IN ASBESTOS ABATEMENT

In Accordance With AHERA

FOR MANAGEMENT PLANNERS

CREDITS: 2 ABIH CERTIFICATION POINTS and 1.5 CEU's

Date: JUNE 30-JULY 1, 1988
Exam Date: JULY 1, 1988
Number: 519-40-8109
Expires: JULY 1, 1989

Course Director

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Exam Date: JUNE 29, 1988
Number: 519-40-8109
Expires: JUNE 29, 1989

Course Director

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-64-

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